

2020 GREEN INFRASTRUCTURE IMPROVEMENT PROJECT

Project Partners:



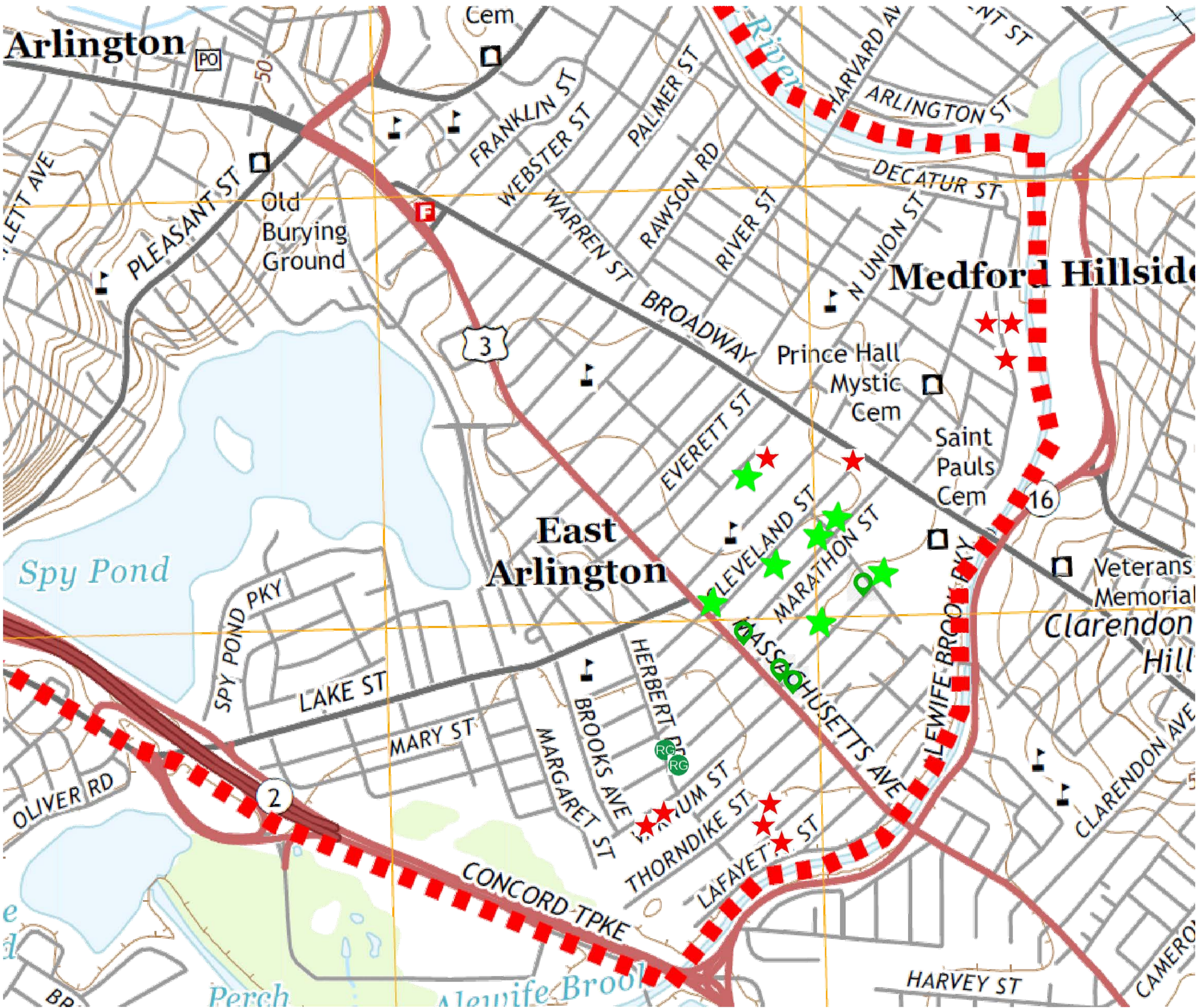
TOWN OF ARLINGTON
Department of Public Works
51 Grove St.
Arlington, MA 02476



Massachusetts Office of Coastal Zone Management
251 Causeway Street, Ste. 800
Boston, MA 02114



Mystic River Watershed Association
20 Academy St., Ste. 306
Arlington, MA 02476



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Project BMP Information:

★ Street Infiltration Trench; Quantity = 10

- Location**
89 Oxford St.
68 Broadway (at Cleveland St.)
88 Sunnyside Ave.
106 Sunnyside Ave.
109 Sunnyside Ave.
44 - 46 Fairmont St.
45 Fairmont St.
54 Thorndike St.
100 Varnum St.
114 - 116 Varnum St.

★ Green Trench: Quantity = 7

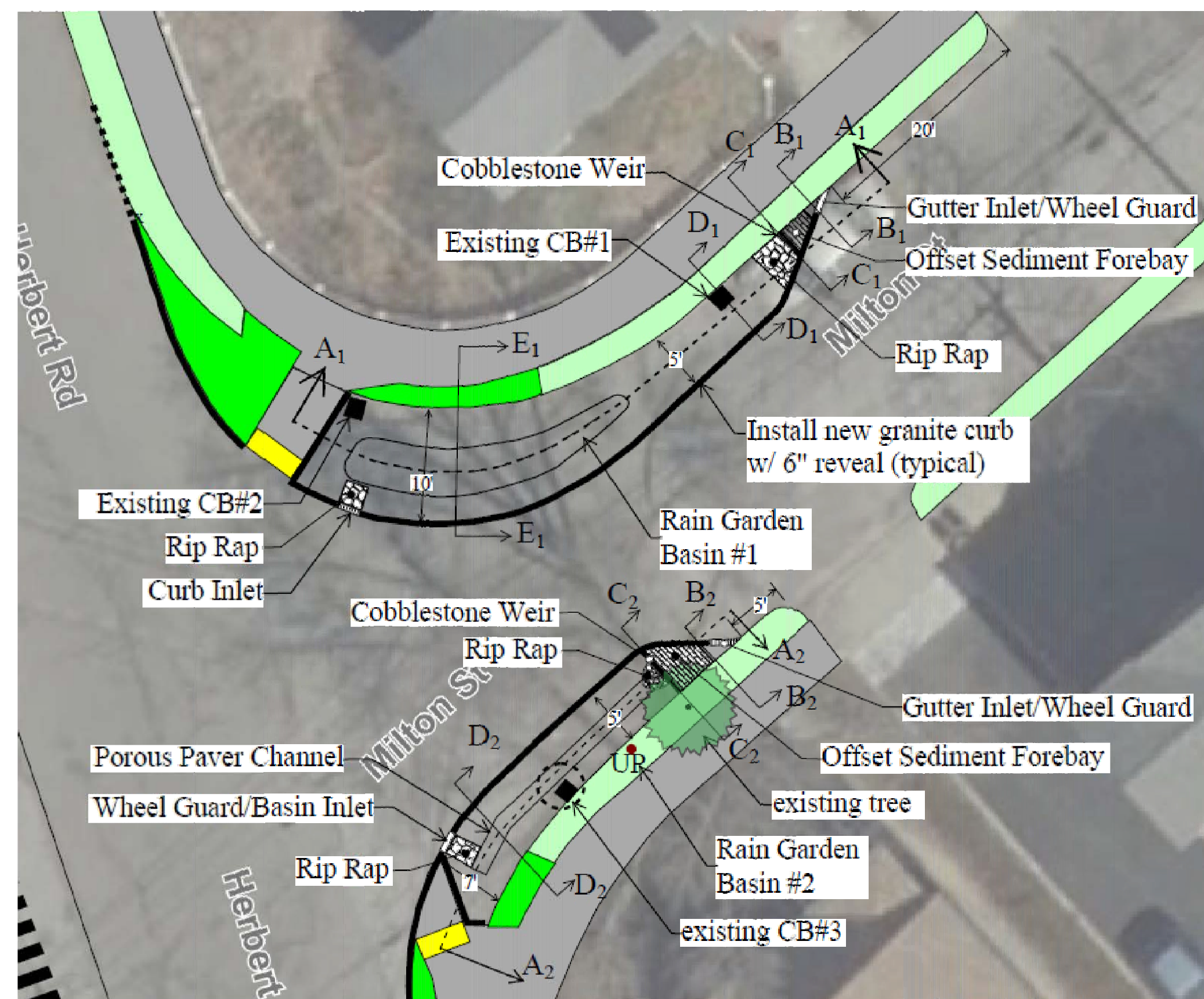
- opposite 58-60 Oxford St.
12 Cleveland St.
35 Cleveland St.
54 Marathon St. (at Waldo)
62 Marathon St. (at Waldo)
40 Waldo Rd.
39 Trowbridge St.

📍 Tree Trench: Quantity = 4

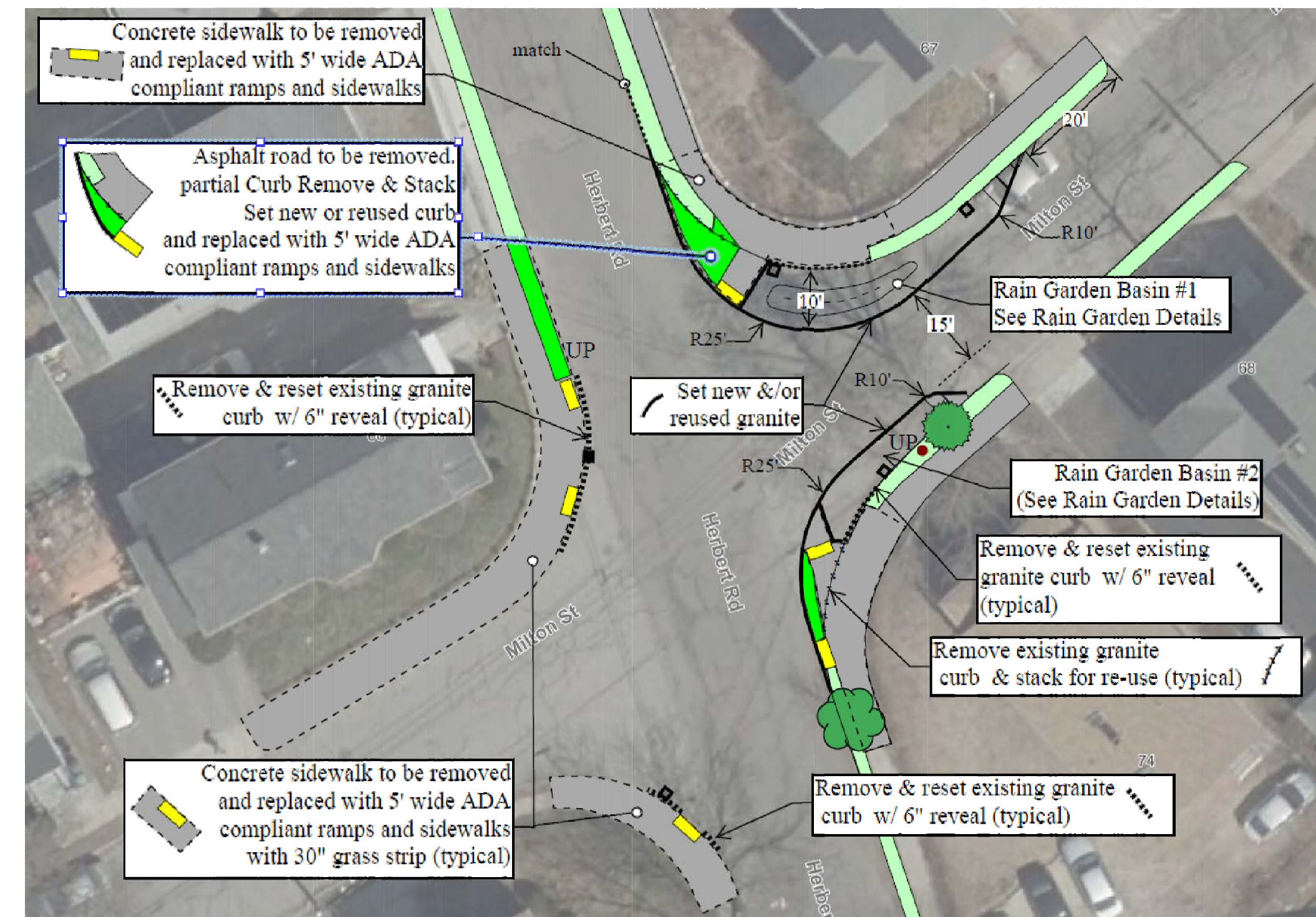
- opposite 36 Waldo Rd.
155 Mass Ave. (at Windsor St.)
115 Mass Ave. (at Windsor St.)
121 Mass Ave. (at Marathon St.)

🌿 Rain Garden; Quantity = 2

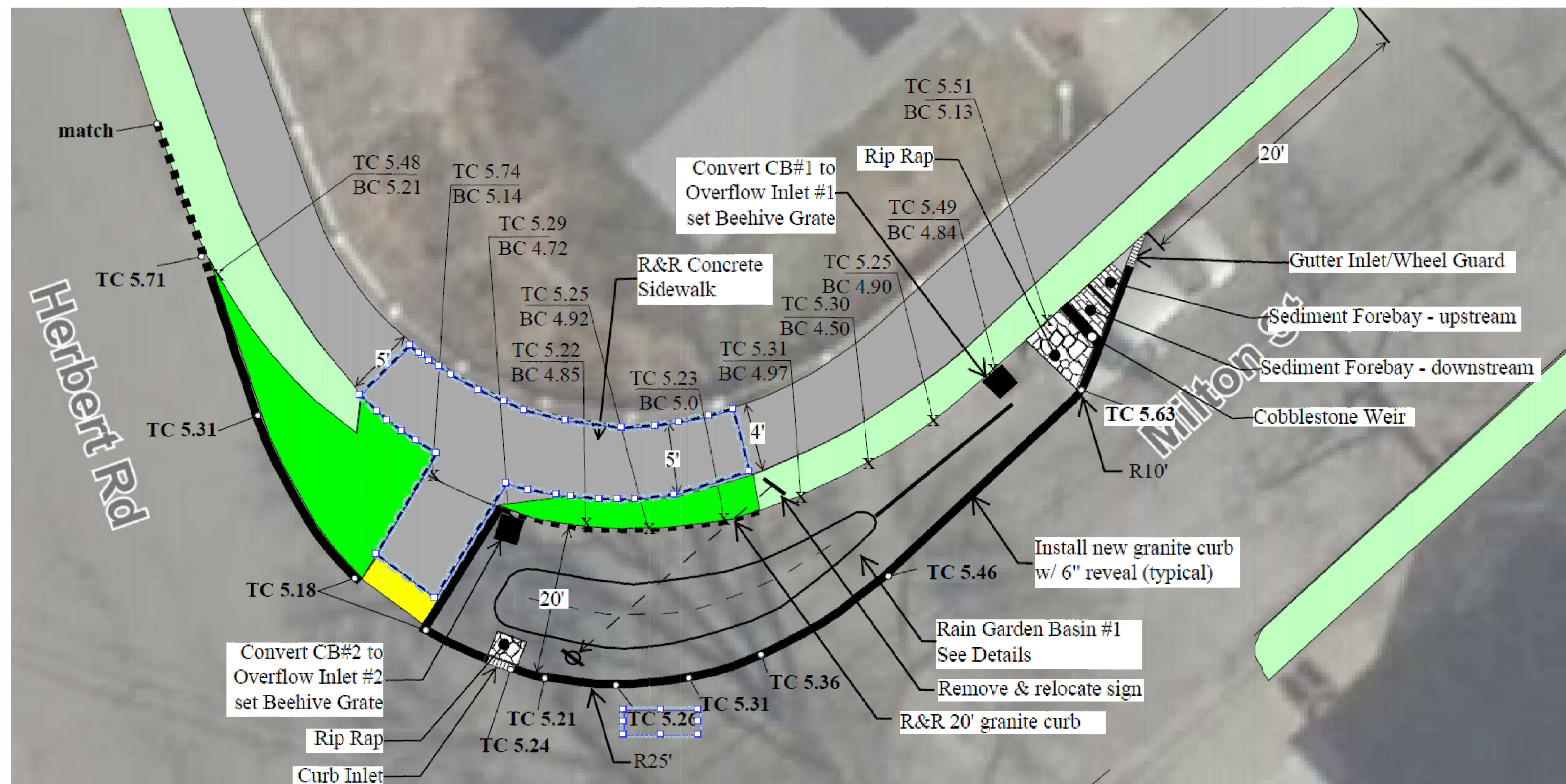
- Intersection of Milton St. & Herbert Rd.



Rain Garden Basin #1 & #2
Cross Section Guide
scale: 1" = 10ft



MILTON - HERBERT INTERSECTION
Proposed Curb & Walk Modifications
Scale: 1" = 20ft



RAIN GARDEN BASIN #1 SCHEMATIC
Scale: 1" = 5ft



MILTON - HERBERT INTERSECTION
Existing Curb & Walk Conditions
scale: 1" = 20ft

NOTES

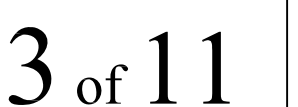
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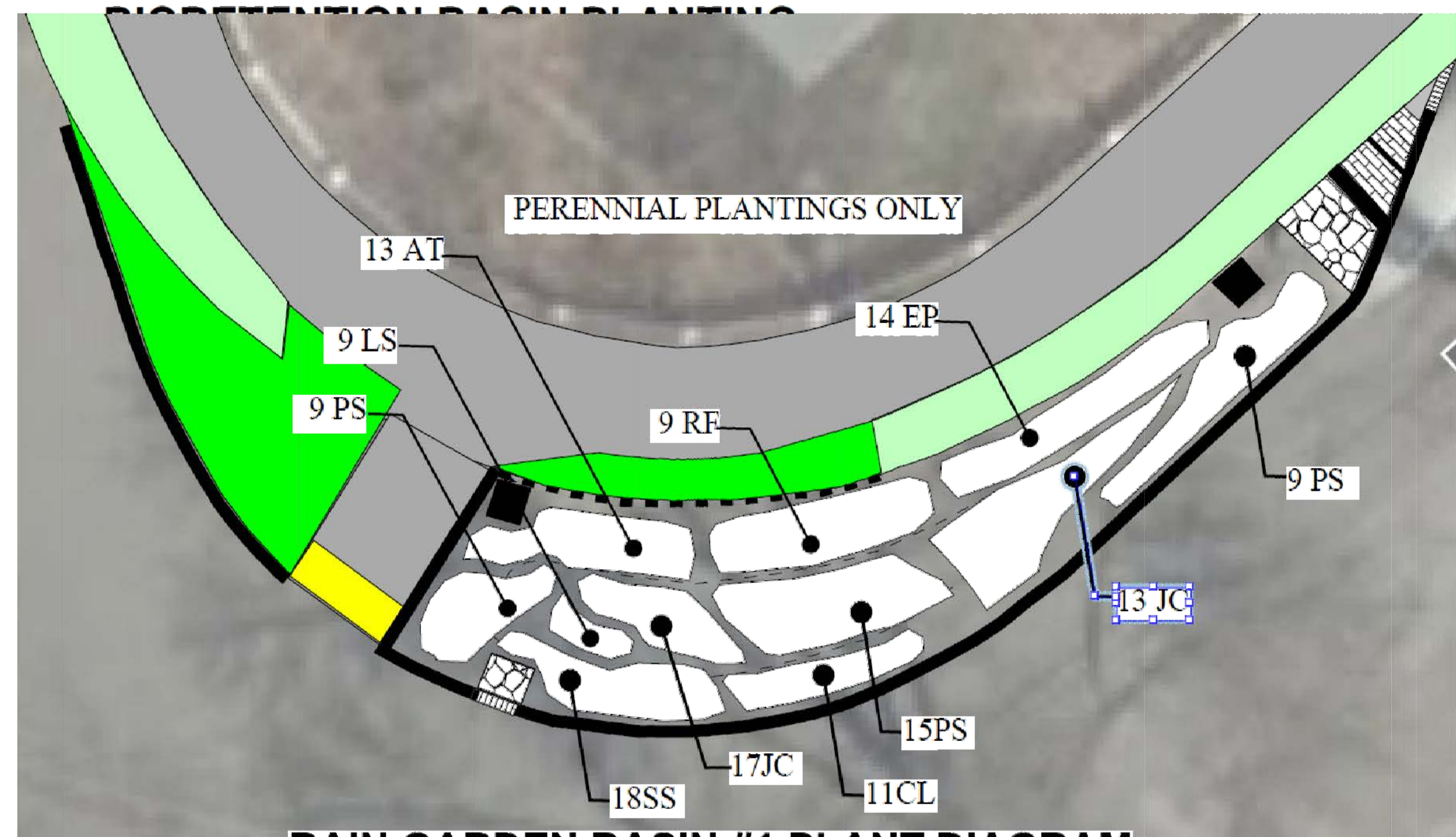
RAIN GARDEN DETAILS

Project:	#20-09	Sheet:	
Drawn By:	WAC		
Scale:	AS NOTED		
Date:	FEBRUARY 2020		



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BIODETENTION BACKPLANTING



Not to Scale

PLANT SCHEDULE					
QTY	SYM	SCIENTIFIC NAME	COMMON NAME	CONTAINER	COMMENTS
22	AT	Asclepias tuberosa	Butterfly Weed	Quart	12" O.C.
24	CL	Chasmanthium latifolia	Northern Sea Oats	#1 cont.	15" O.C.
22	EP	Echinacea purpurea	Purple Cone Flower	Quart	12" O.C.
50	JC	Juncus canadensis	Canada Rush	Quart	12" O.C.
9	LS	Liatris spicata	Gayfeather	Quart	12" O.C.
62	PS	Panicum virgatum	Switchgrass	#2 cont.	15" O.C.
16	RF	Rudbeckia fulgida	Black Eyed Susan	#1 cont.	15" O.C.
36	SS	Schizachyrium scoparium	Little Bluestem	Quart	12" O.C.

Bioretention Area Material Specifications		
Material	Specification	Notes
Filter Media Soil	<p>Filter Media to contain:</p> <ul style="list-style-type: none"> • 40% Sand • 20-30% topsoil (<5% clay) • 30-40% compost <p>Organic content is to be 1.5% to 3%. Volume of material is to be 110% of plan volume to account for settling or compaction.</p>	<p>Sand should be gravelly sand using ASTM D422.</p> <p>Topsoil shall be a USDA soil type sandy loam, loamy sand or loam texture.</p> <p>Compost must be processed from yard waste per MassDEP Guidelines.</p>
Mulch Layer	Fine shredded hardwood mulch. Well-aged (6 months minimum.	2-inch layer on the surface of the filter media soil, mixed 1 inches into the filter media soil.
Filter Fabric	Non-woven geotextile fabric with flow rate of > 110 gallons/minute/square foot.	For use on bottom of filter media.
Erosion Control Blanket	Woven, 100% biodegradable jute fiber, 7.7 lbs./1000 sq. ft.	To be used on bioretention area side slopes > 3:1.
Plant Material	All plant materials shall conform to the guidelines of the "American Standard for Nursery Stock", latest edition.	Plant species and quantities per the plans.
Grass Seed	Use seed mix from Item 765.6 for side slopes.	Application rate of 25 lbs./acre or per seed manufacture's requirements.

15'

Wheel Guard/Inlet Apron

Offset Sediment Forebay

Rip Rap

Rain Garden Basin #2

Convert CB#3 to Overflow Inlet #3 set Beehive Grate

Hooded Outlet

TC 5.43

TC 5.45

TC 5.32

TC 5.34 BC 4.90

TC 5.50 BC 5.02

TC 5.46 BC 5.05

TC 5.38 BC 4.94

TC 5.24 BC 4.76

TC 5.20 BC 4.74

TC 5.13 BC 4.78

existing tree

UP

A₂

B₂

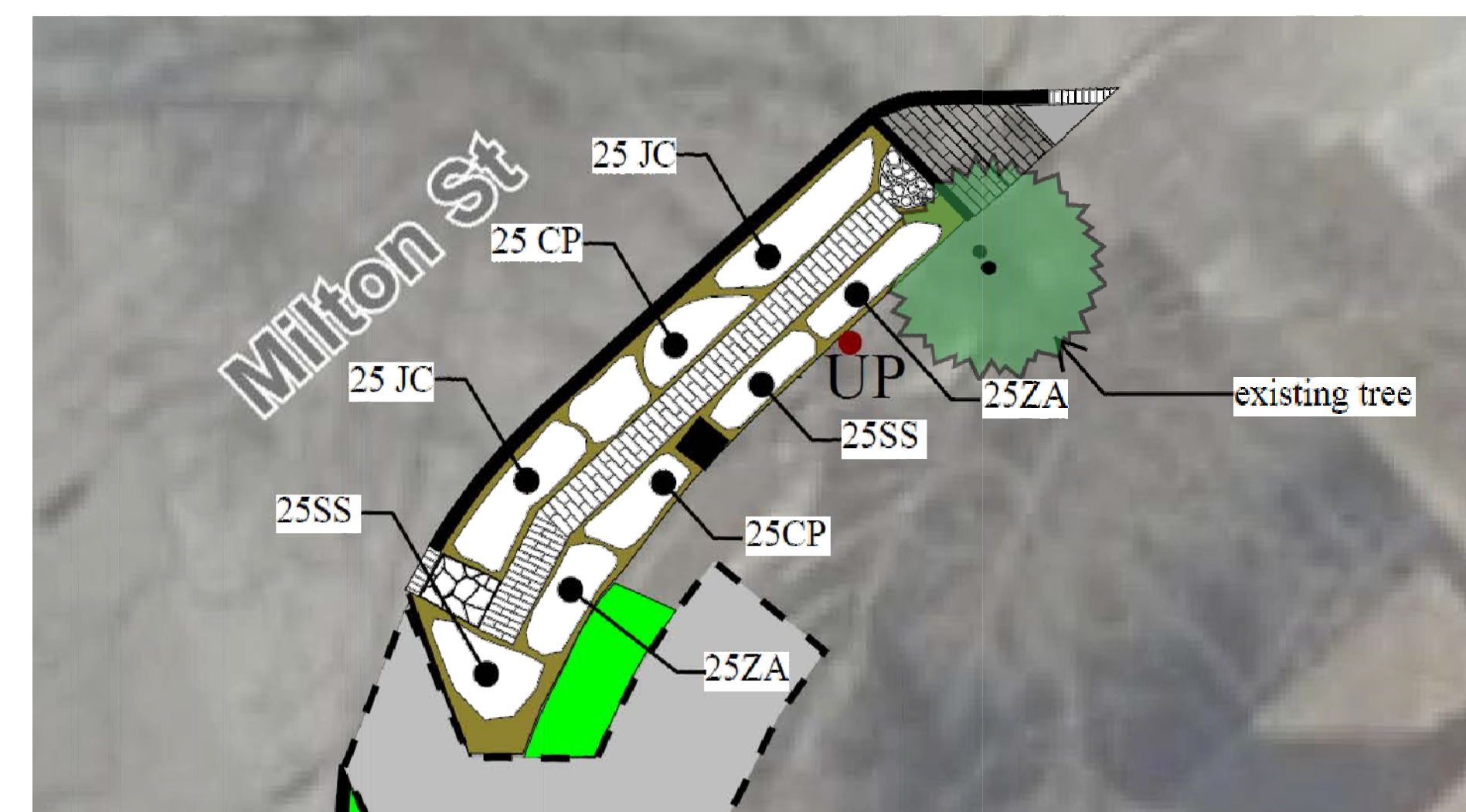
C₂

D₂

5'

1.5'

Scale 1" = 5 ft



Not to Scale

PLANT SCHEDULE					
QTY	SYM	SCIENTIFIC NAME	COMMON NAME	CONTAINER	COMMENT
50	SS	Schizachyrium scoparium	Little Bluestem	Quart	12" O.C.
50	JC	Juncus canadensis	Canadian Rush	Quart	12" O.C.
50	CP	Carex pensylvanica	Pennsylvania Sedge	Quart	12" O.C.
50	GA	Zizia aurea	Golden Alexanders	Quart	12" O.C.

NOTES

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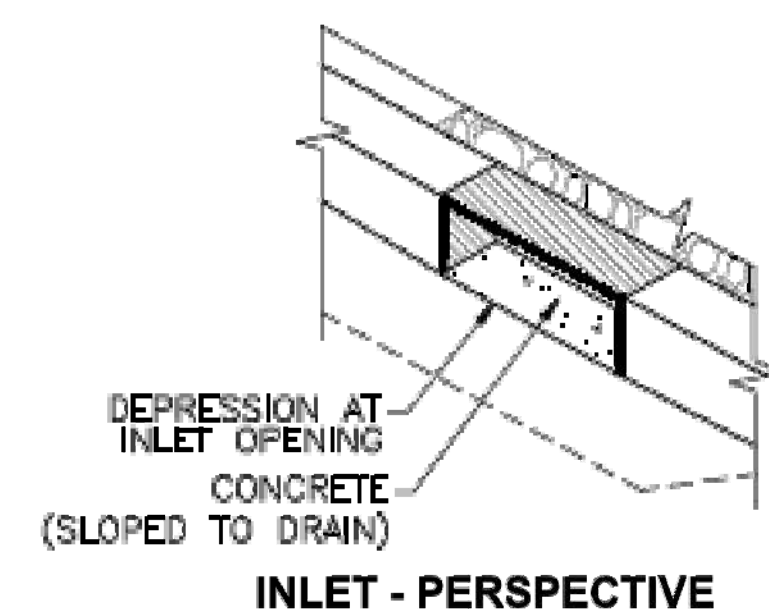
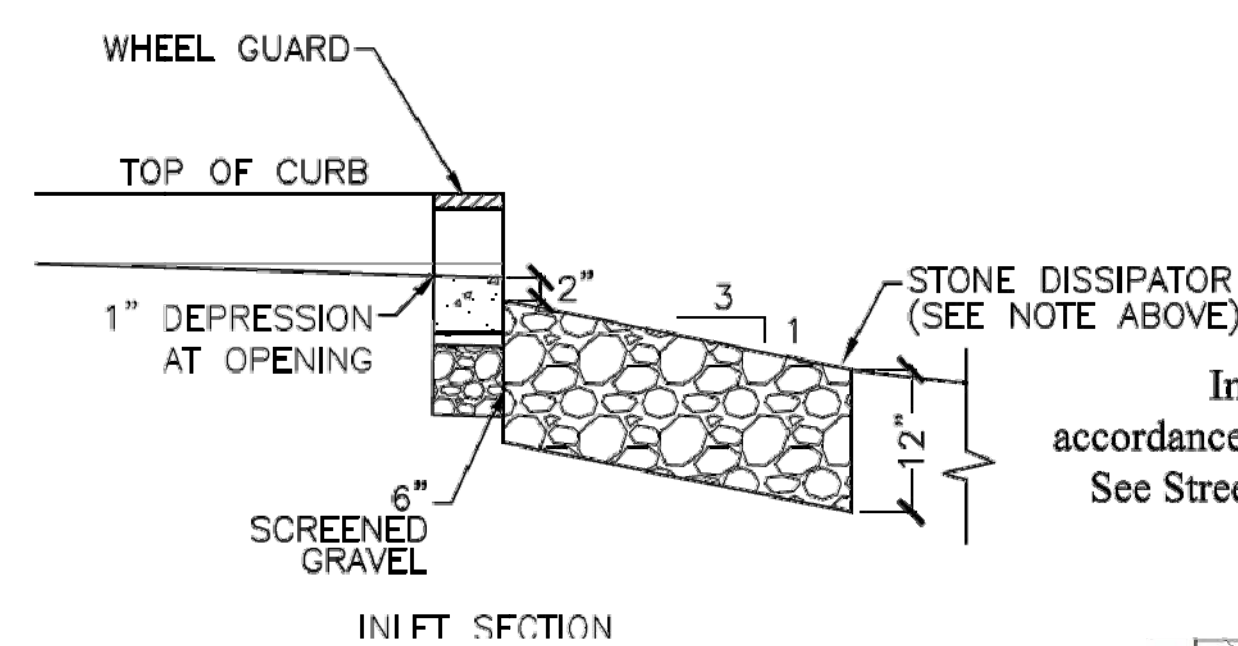
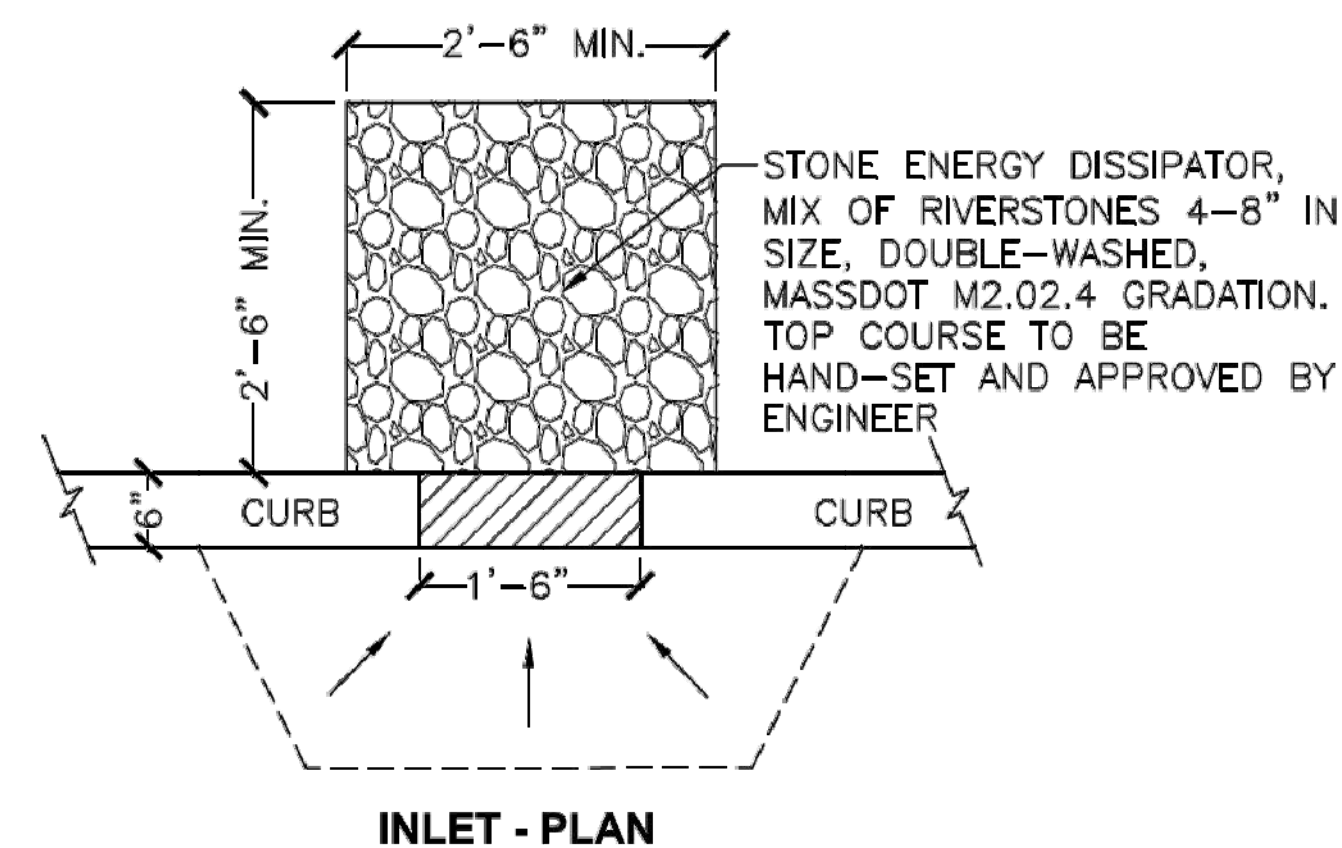
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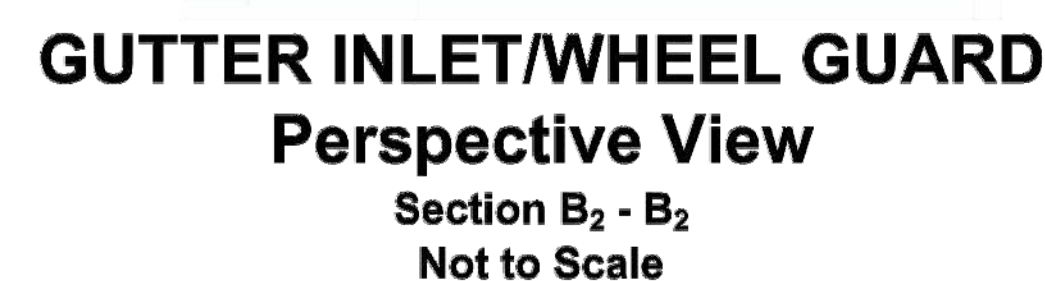
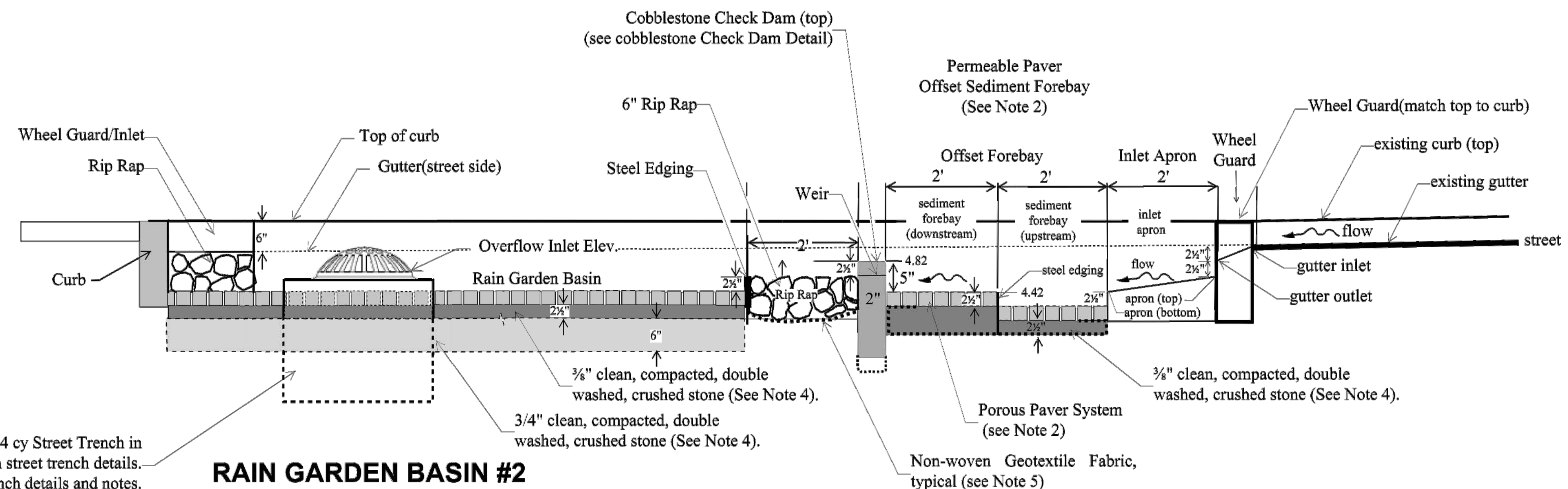
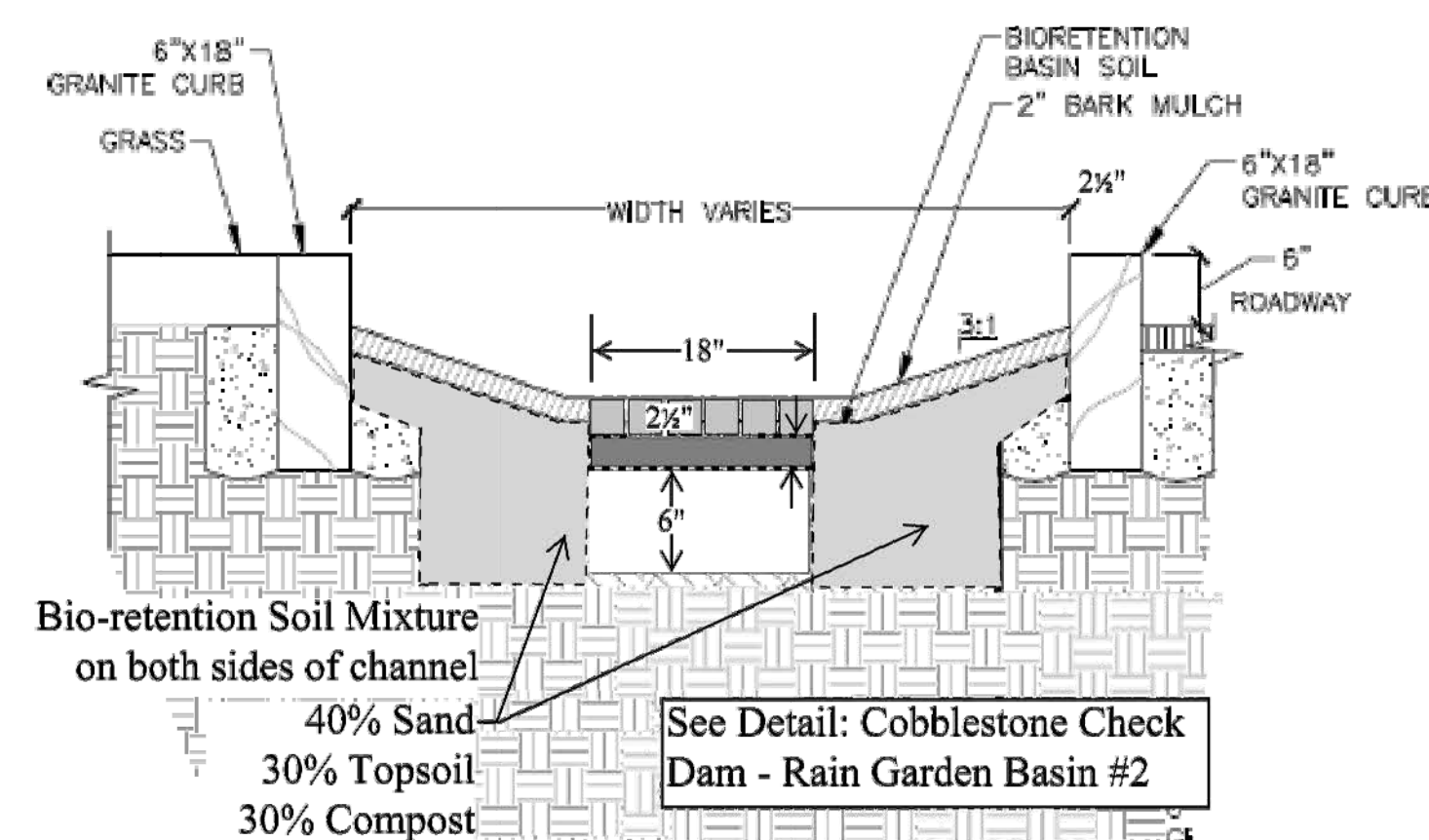
RAIN GARDEN DETAILS

Project:	#20-09
Drawn By:	WAC
Scale:	AS NOTED
Date:	FEBRUARY 2020

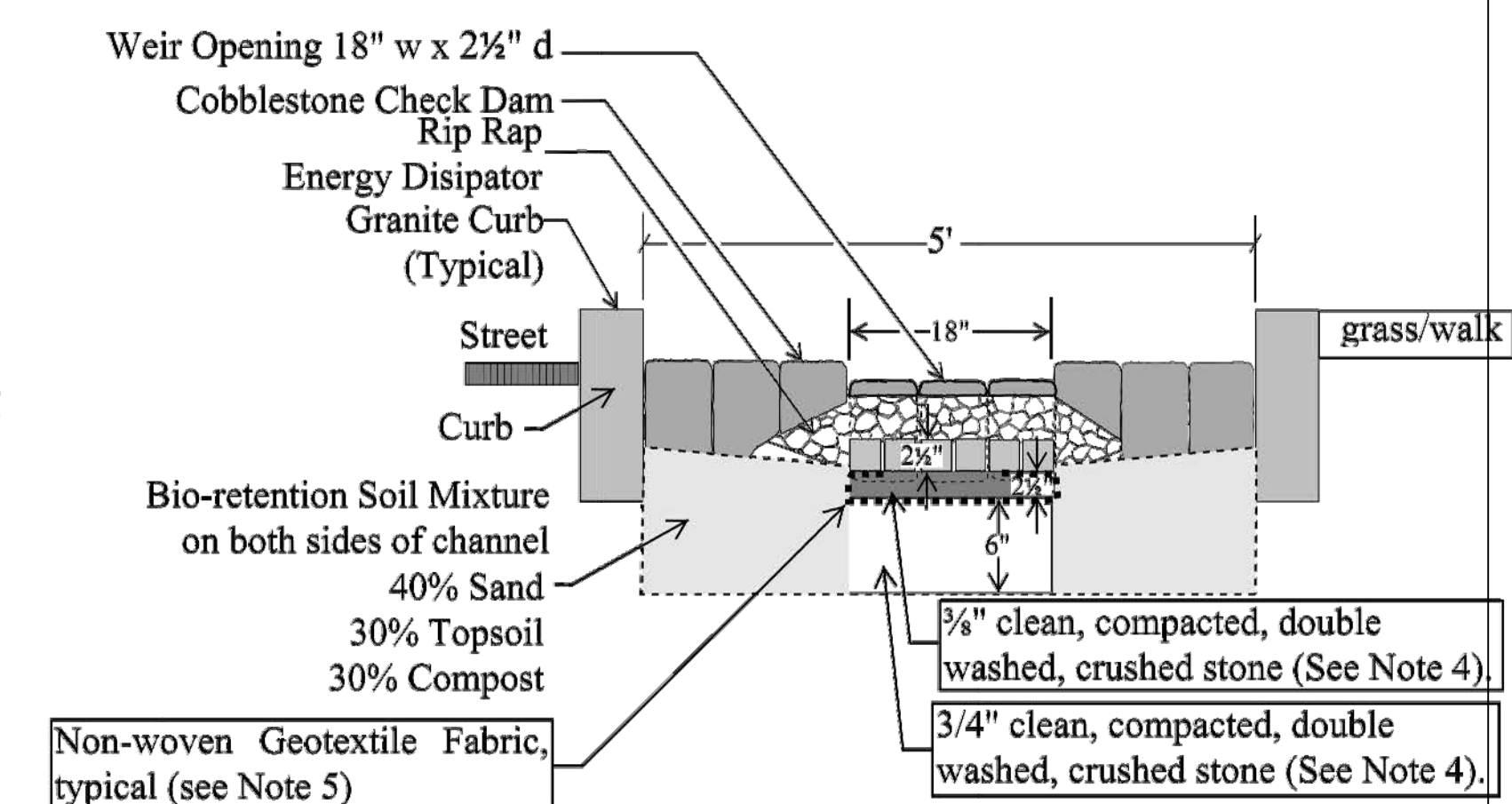
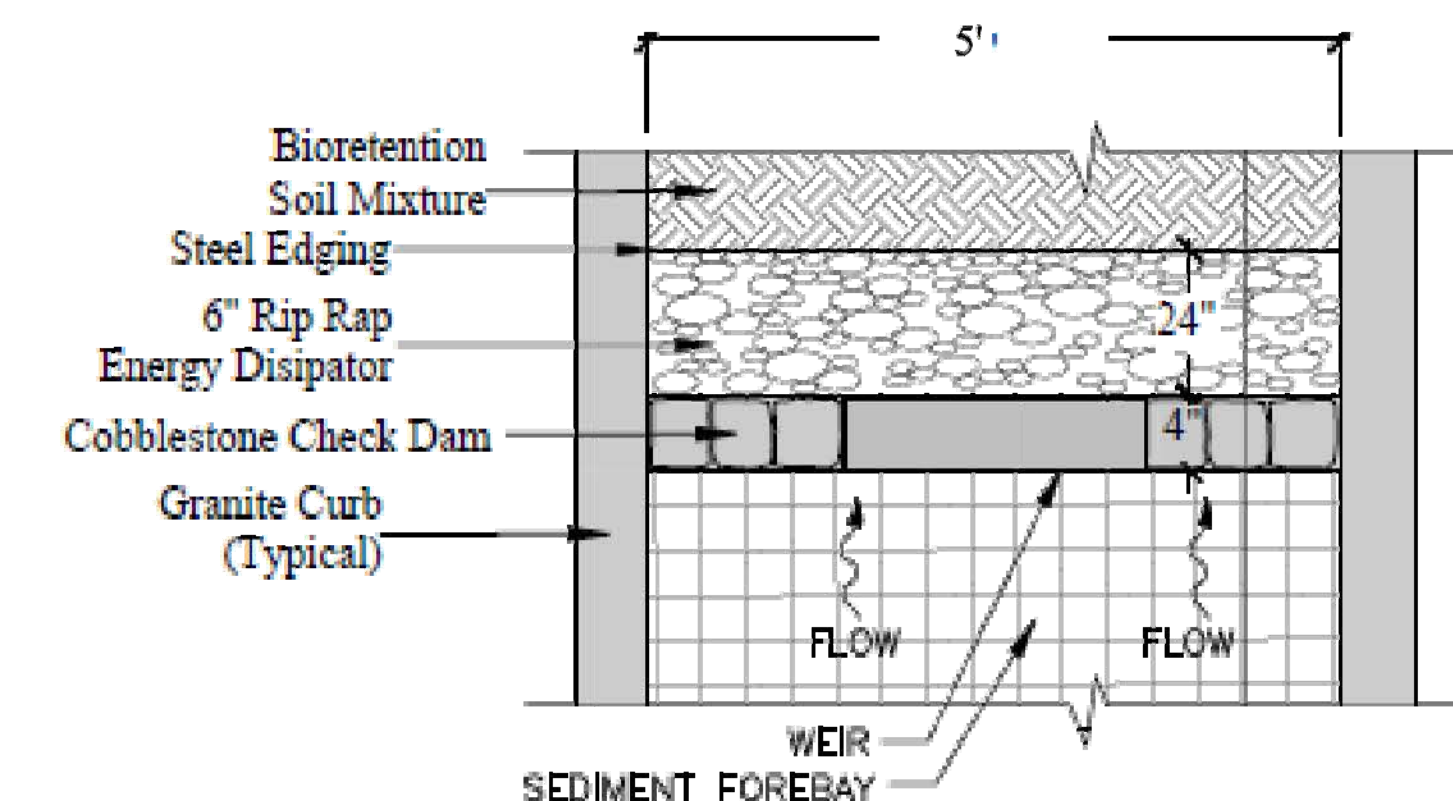
Sheet: 4 of 11



CURB INLET w/ RIP RAP
Not to Scale



Design Elevations:
 Gutter Inlet = 5.02
 Gutter Outlet = 4.82
 Inlet Apron (top) = 4.62
 Inlet Apron (bottom) = 4.42
 Sediment Forebay (upstream) = 4.22
 Sediment Forebay (downstream) = 4.42
 Top of Check Dam = 4.82
 Weir Level = 4.62
 Top of Rip Rap = 4.62
 Bottom of Rip Rap = 4.12
 Overflow Inlet - Bee Hive Grate = 4.62
 Porous Paver Channel = 4.42



Notes:

- 1) All granite curbing shall be set in concrete and joints filled/pointed with mortar.
- 2) All cobblestone features shall be set in mortar and surface joints pointed with hydraulic cement.
- 3) Steel Edging shall be type: 5" x 2.5mm Heavy Duty Cor-Ten "EverEdge" Steel Edging (or equal). Installation shall conform to manufacturer instructions.
- 4) Porous paver system shall be open-cell paver, brick-gap or other type and shall be approved by Engineer prior to construction. Sediment forebays shall be installed level. Non-woven geotextile fabric to be placed between 3/8" and 3/4" stone layers and overlap top of 3/8" layer by a min.6".
- 5) Rip Rap shall comply with current version of MassDOT standard specifications M2.02.4.
- 6) Crushed stone shall comply with current version of MassDOT standard specifications; M2.01.4.
- 7) Geotextile Fabric shall adhere to current version of MassDOT standard specifications; M9.50.0.
- 8) Rain Garden construction shall comply with material and construction specifications for Bioretention Area from MassDEP Massachusetts Stormwater Handbook.
- 9) Rain Garden Basins are located within existing paved roadway. All bituminous concrete, sub-base gravel and other materials shall be excavated to suitable depth to construct as detailed.
- 10) Rain Garden shall be topped with 2" of Hardwood Mulch after plantings are complete

NOTES

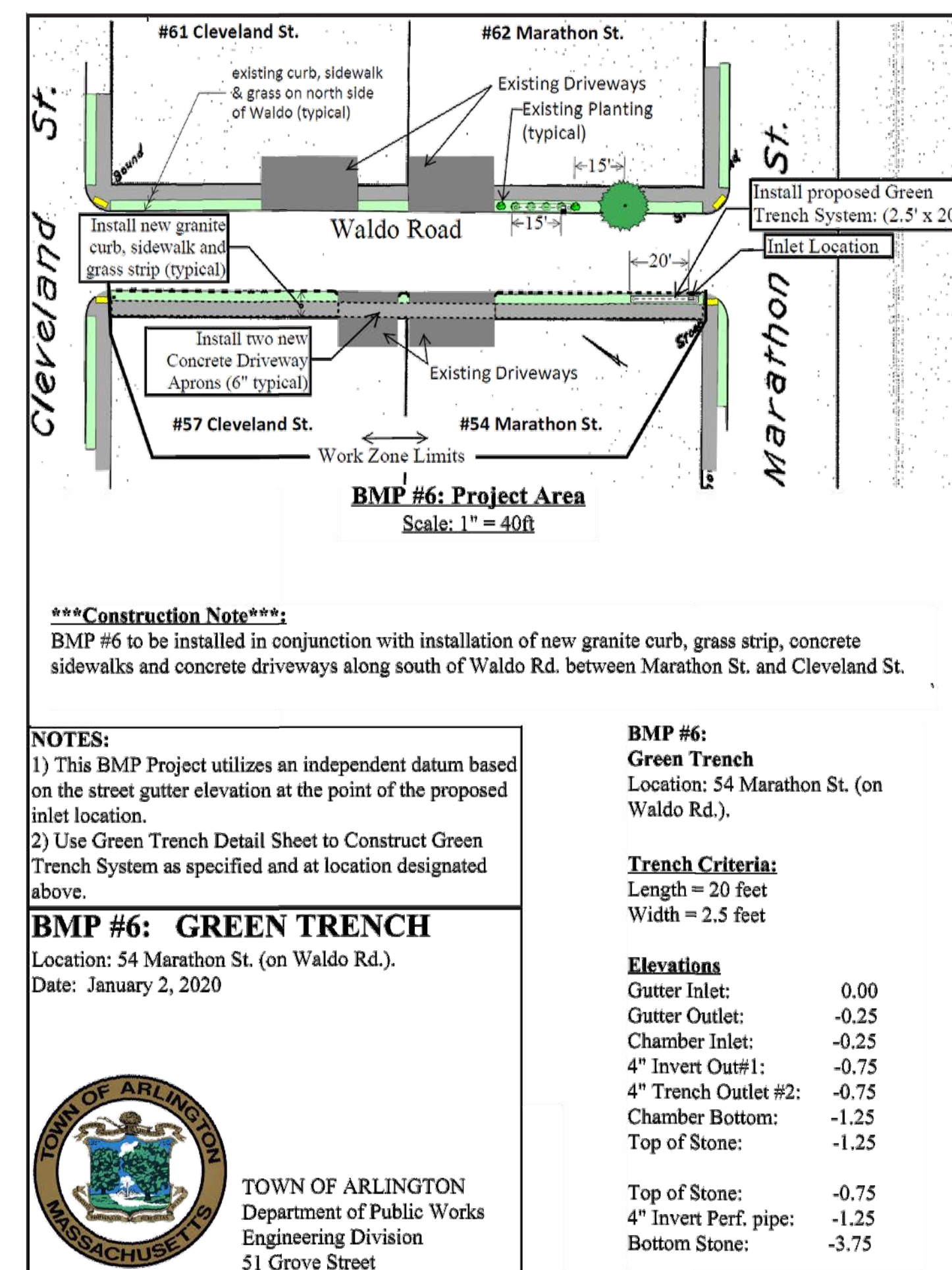
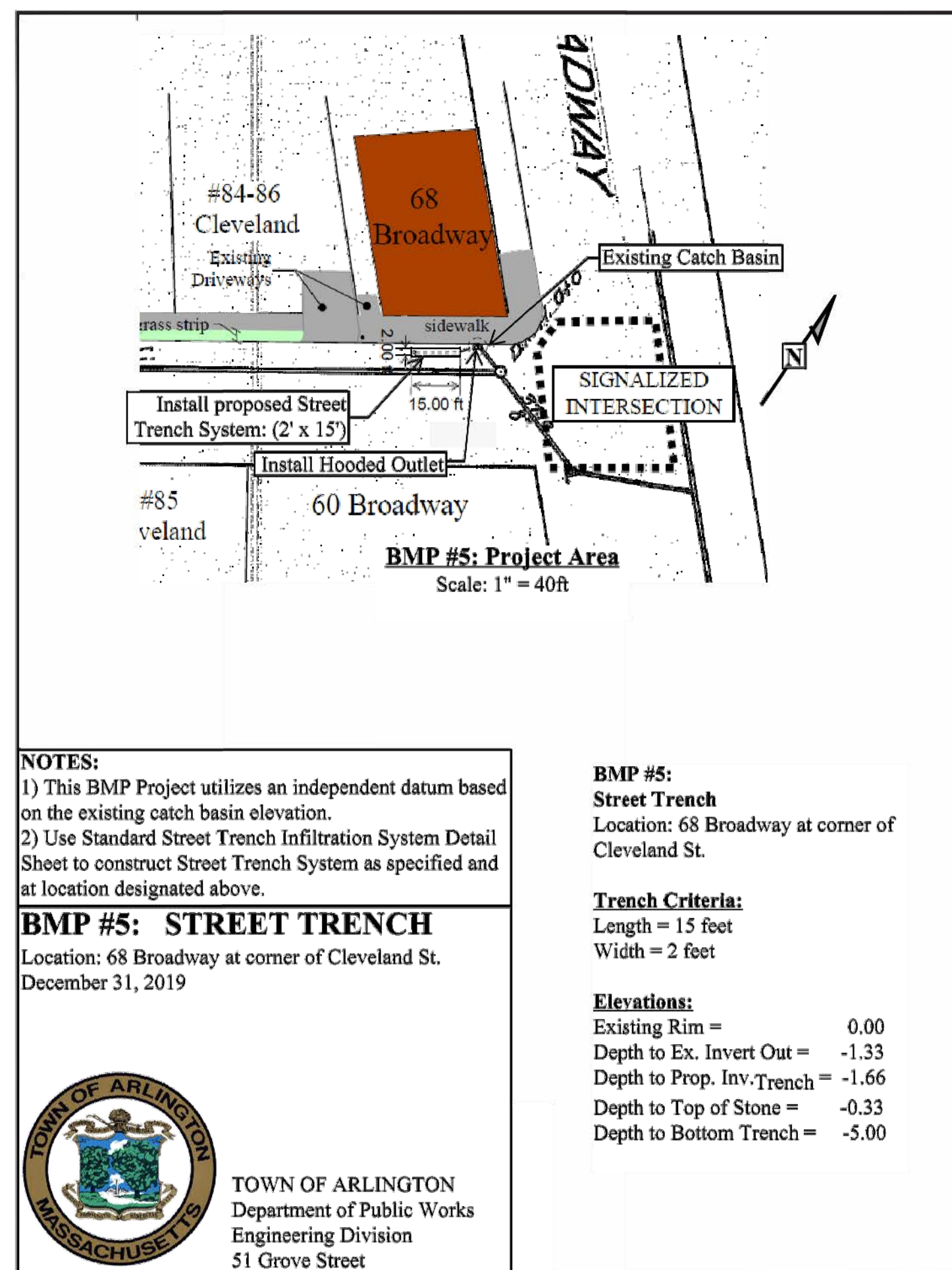
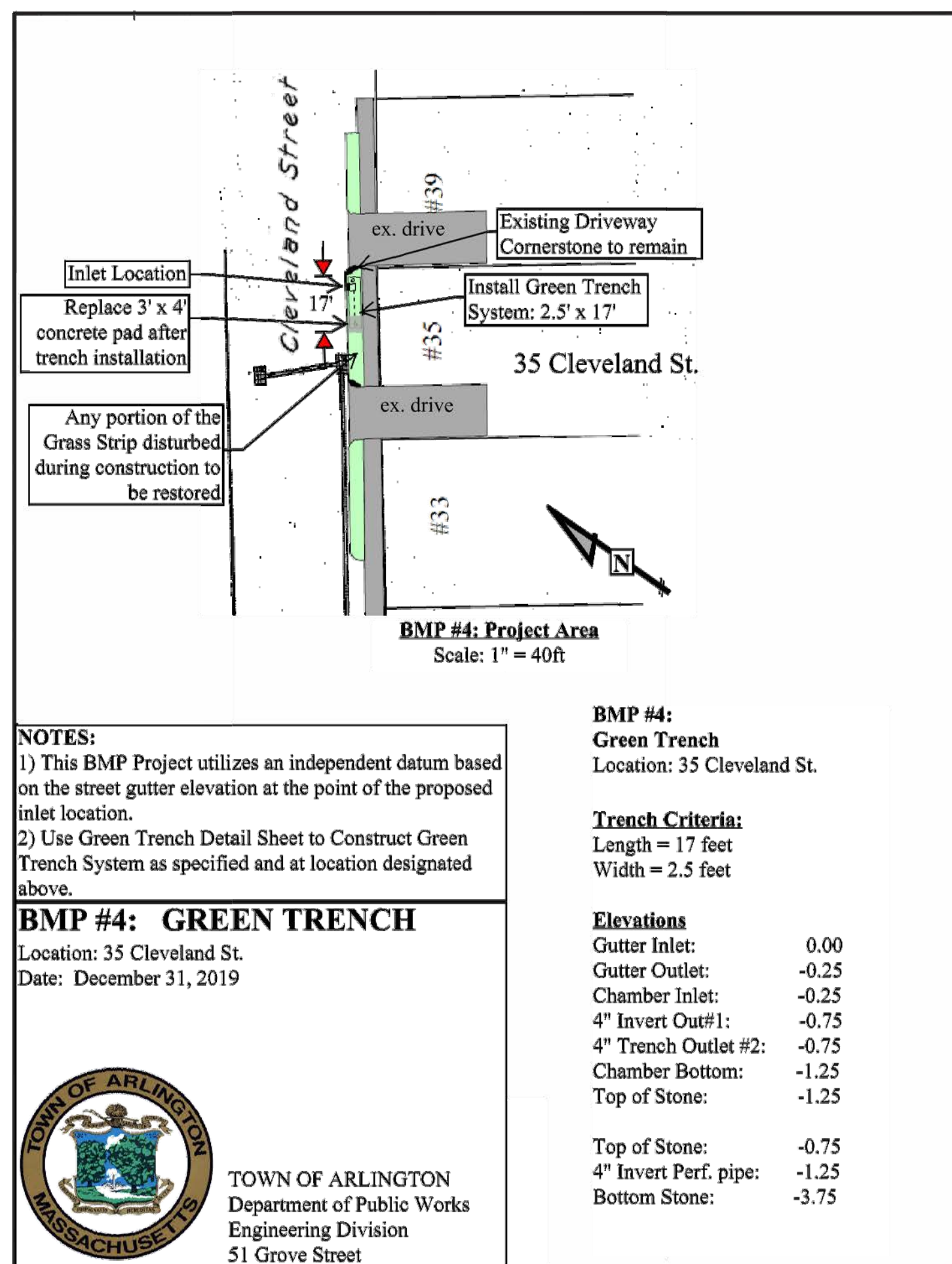
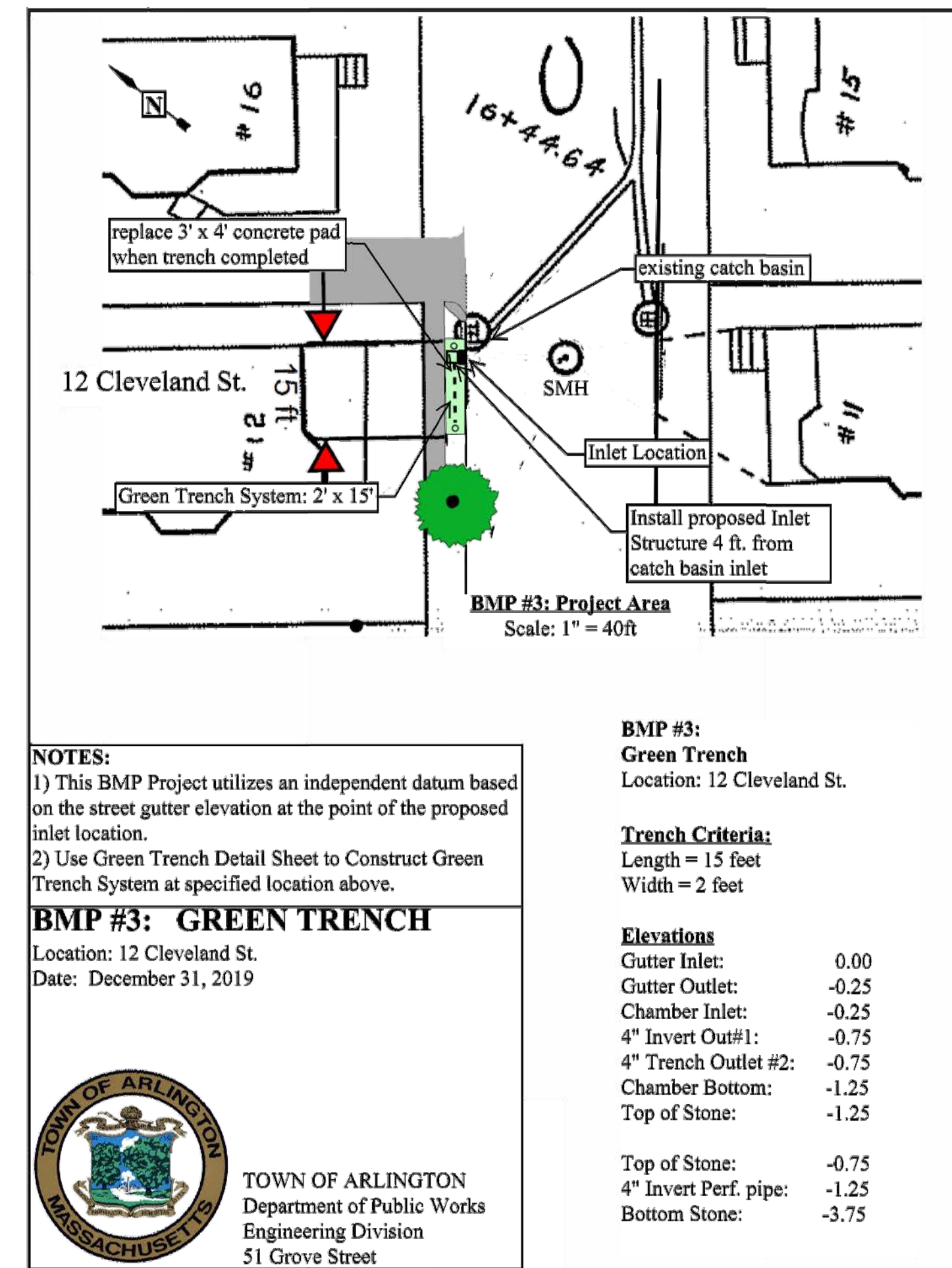
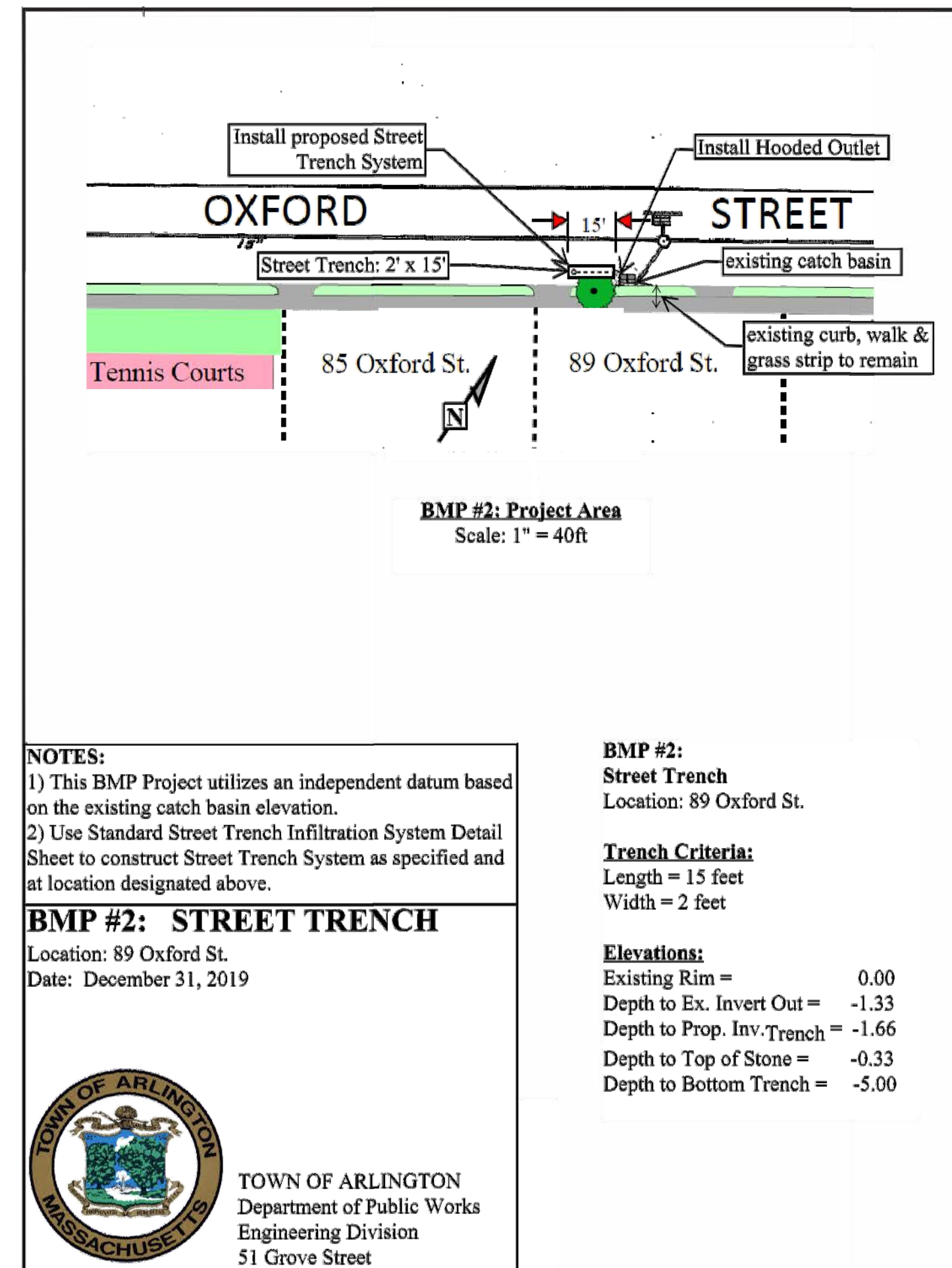
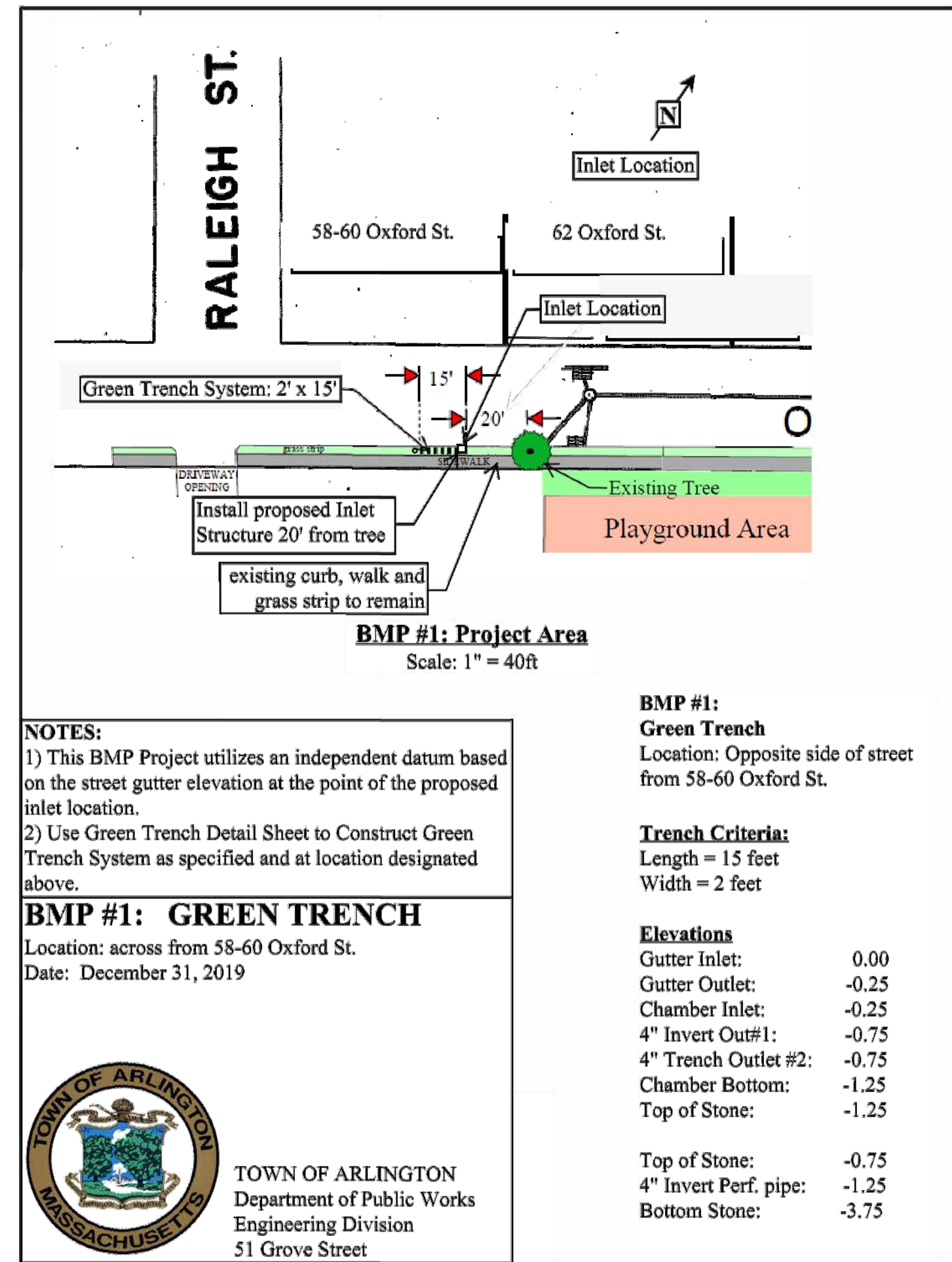
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RAIN GARDEN DETAILS

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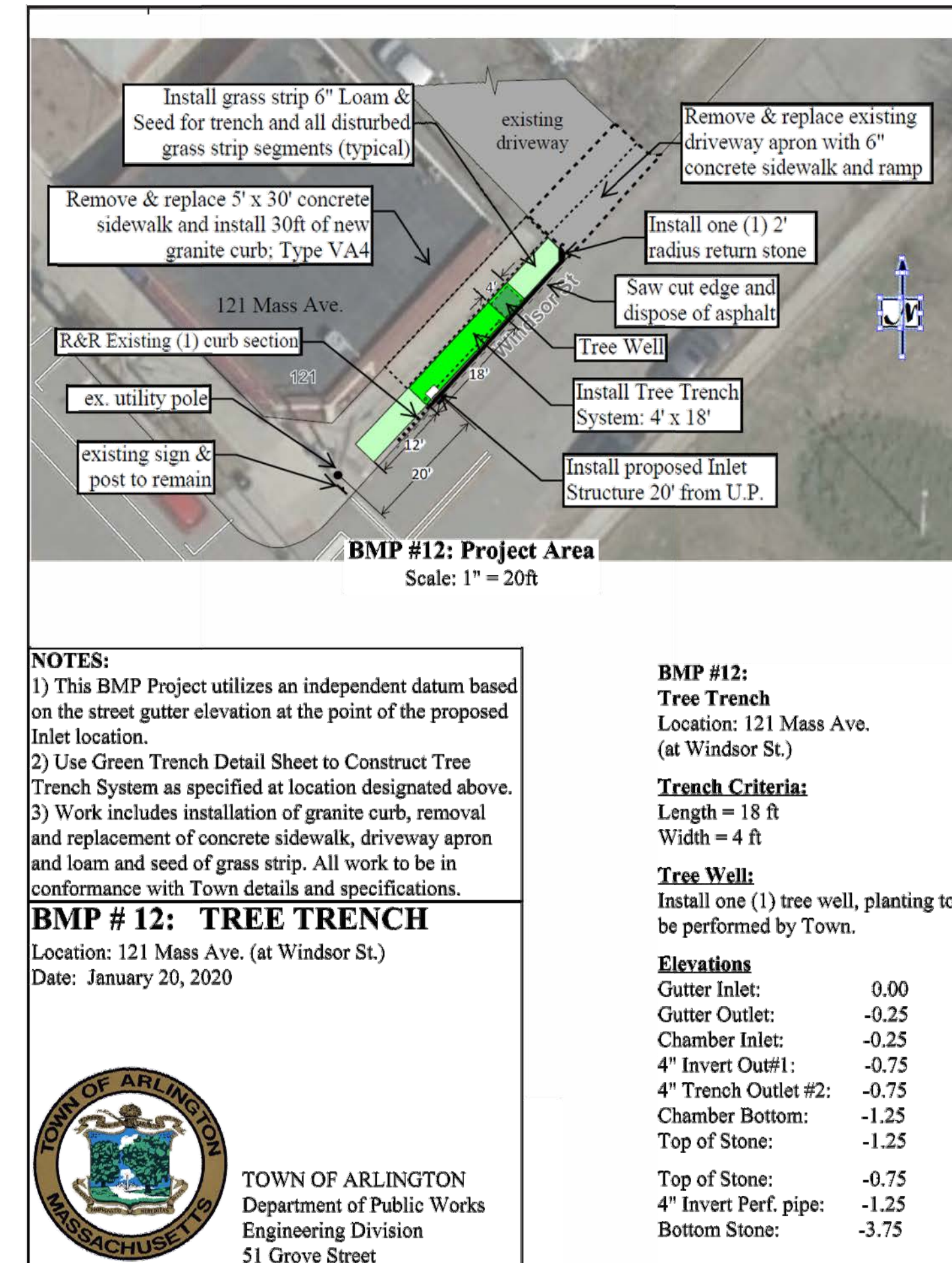
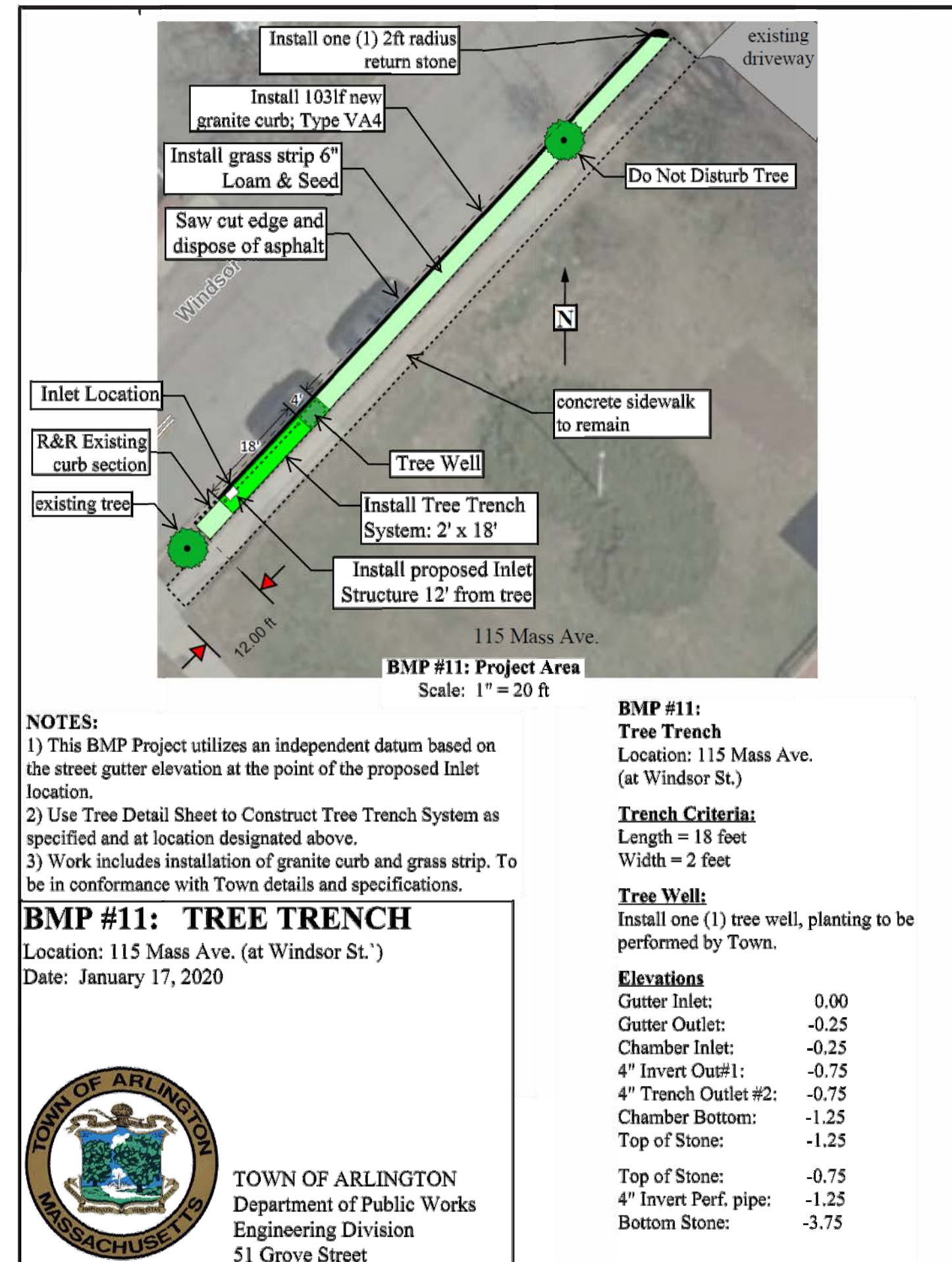
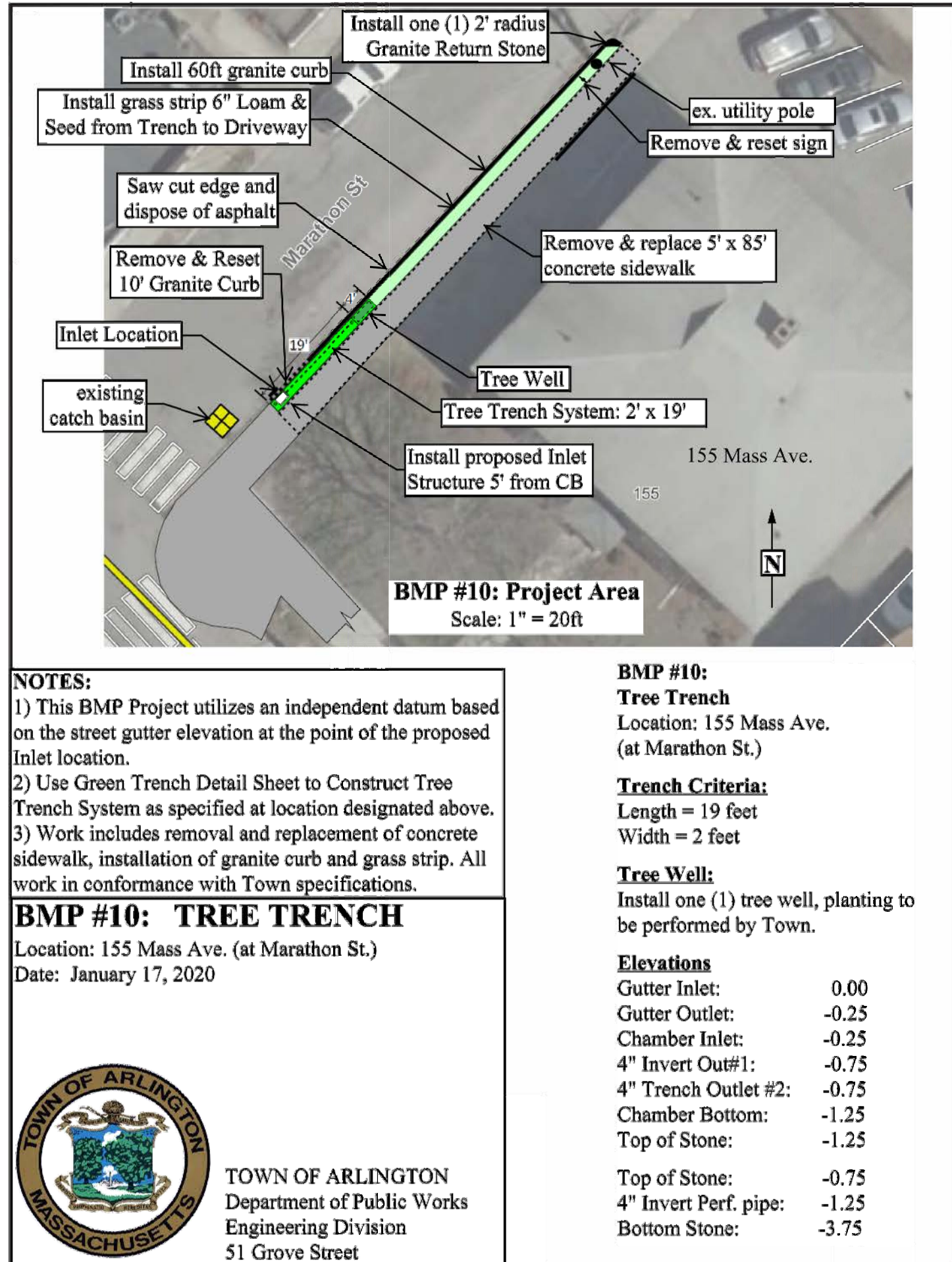
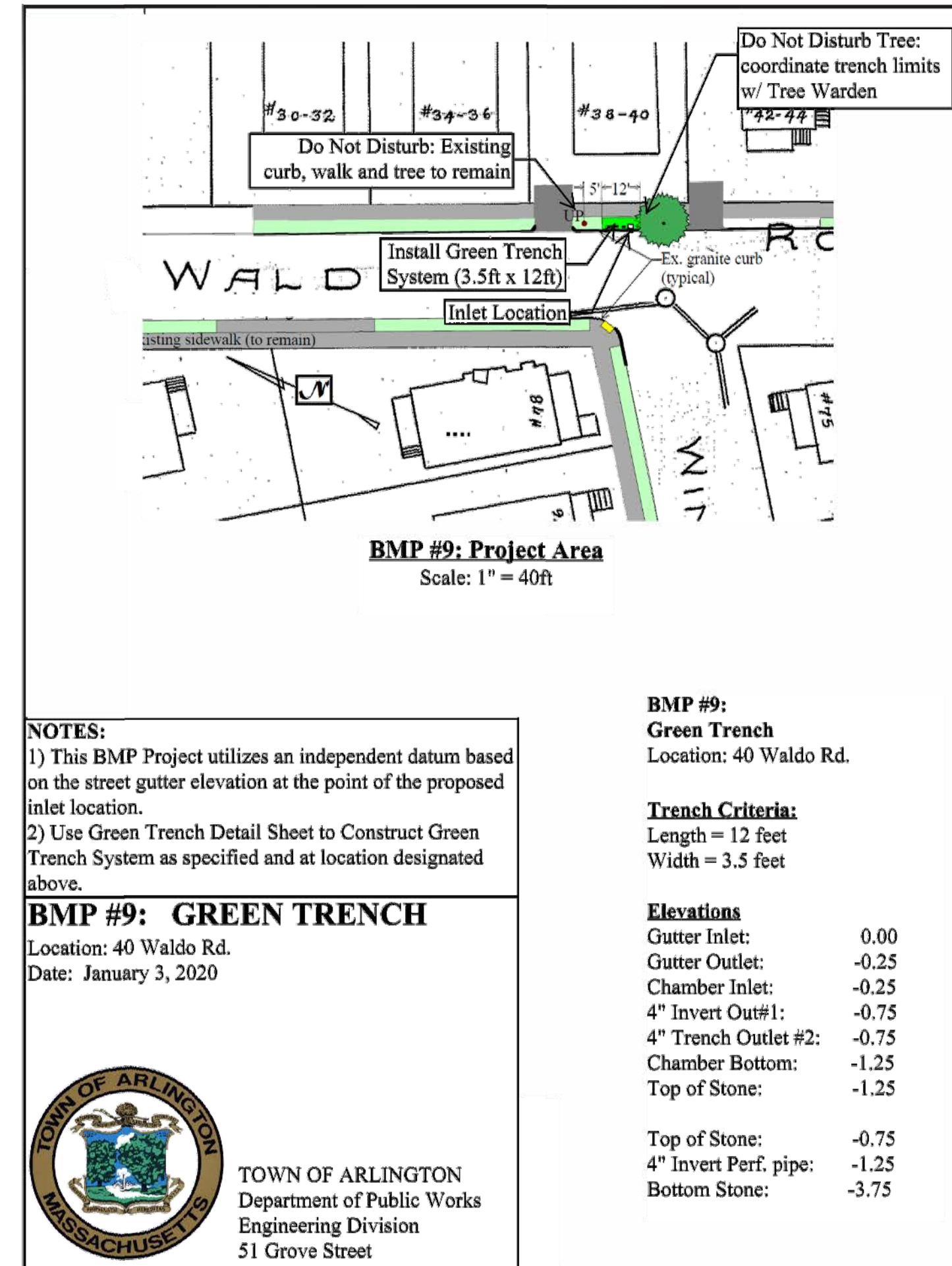
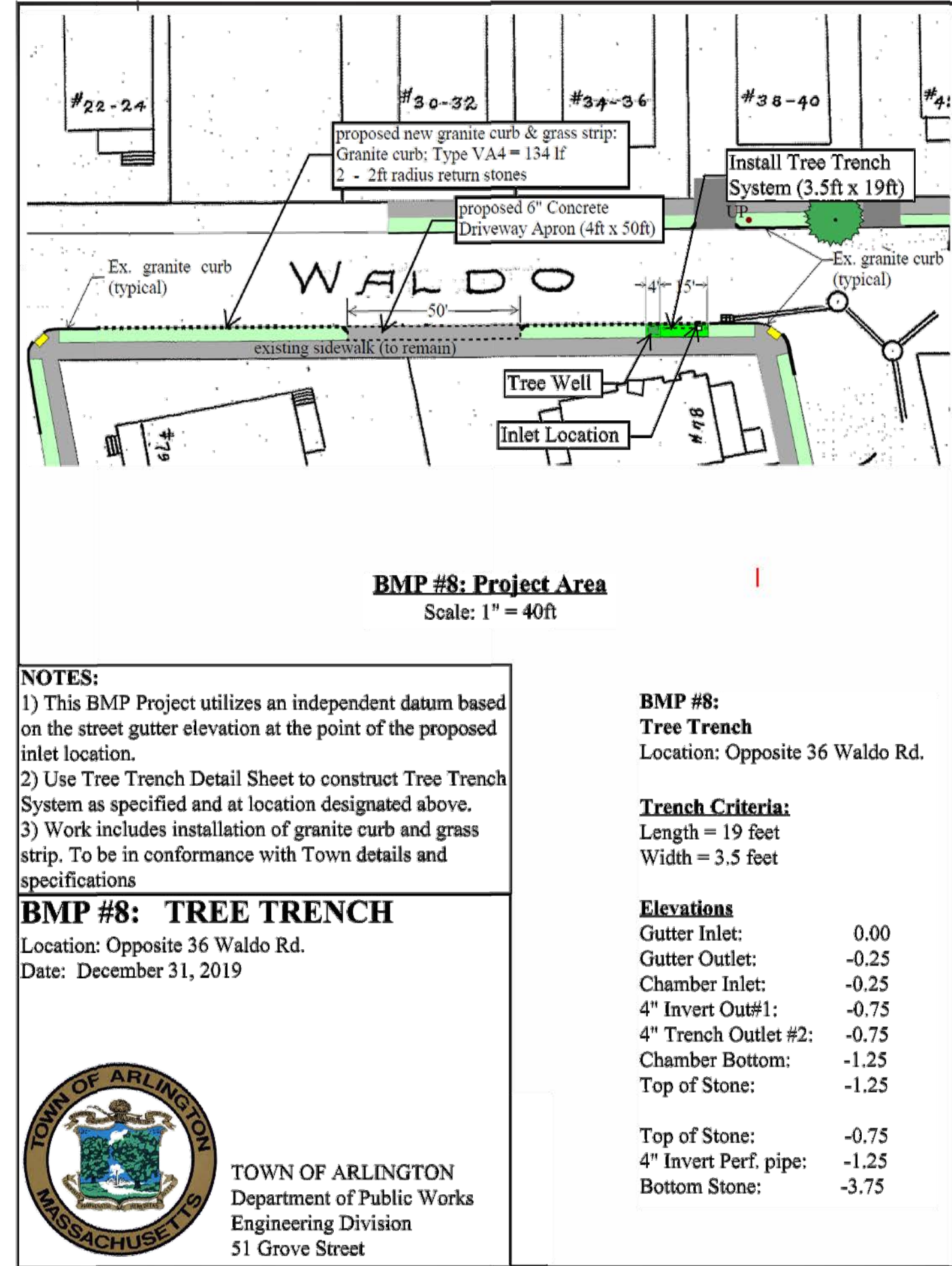
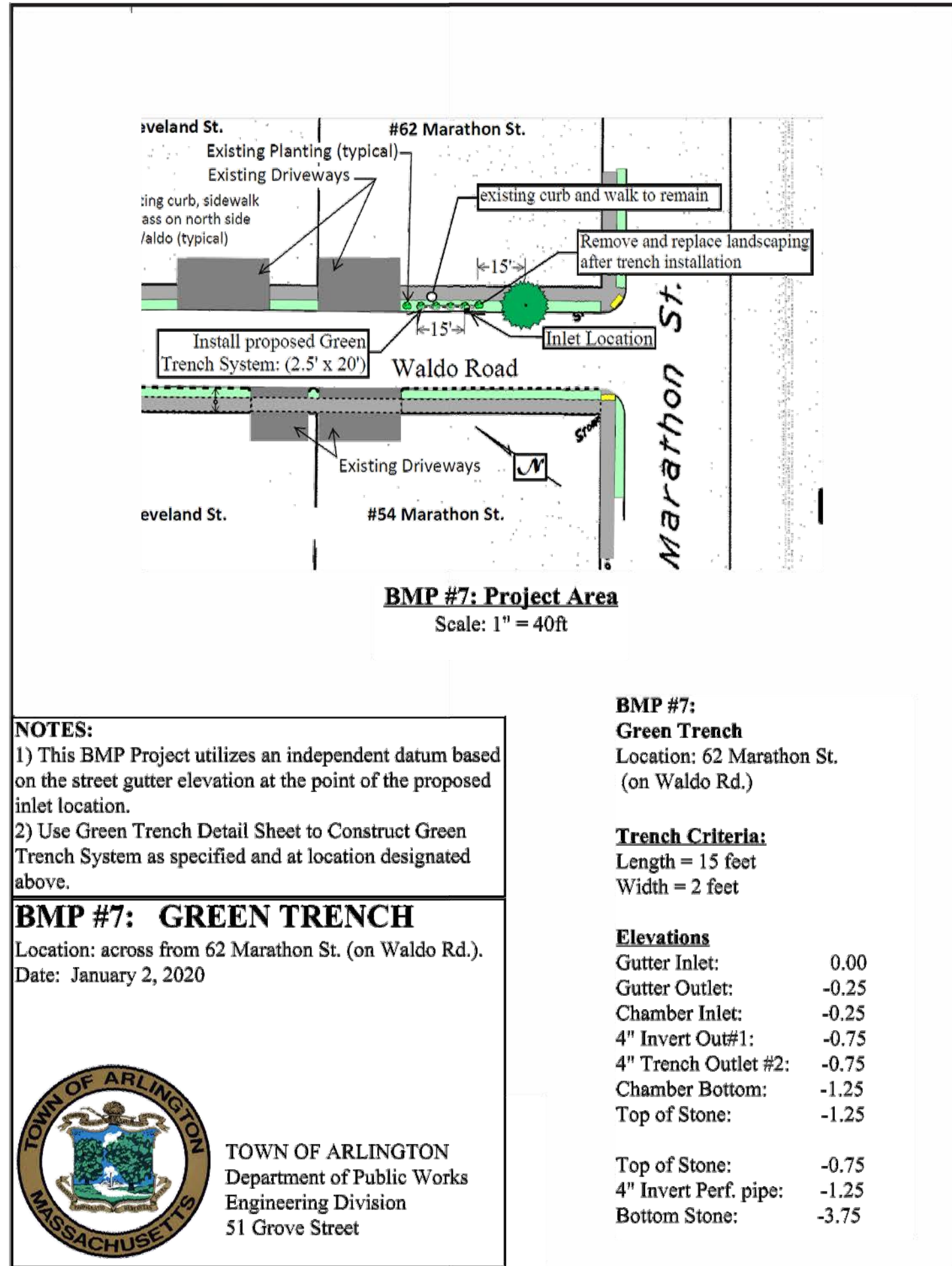
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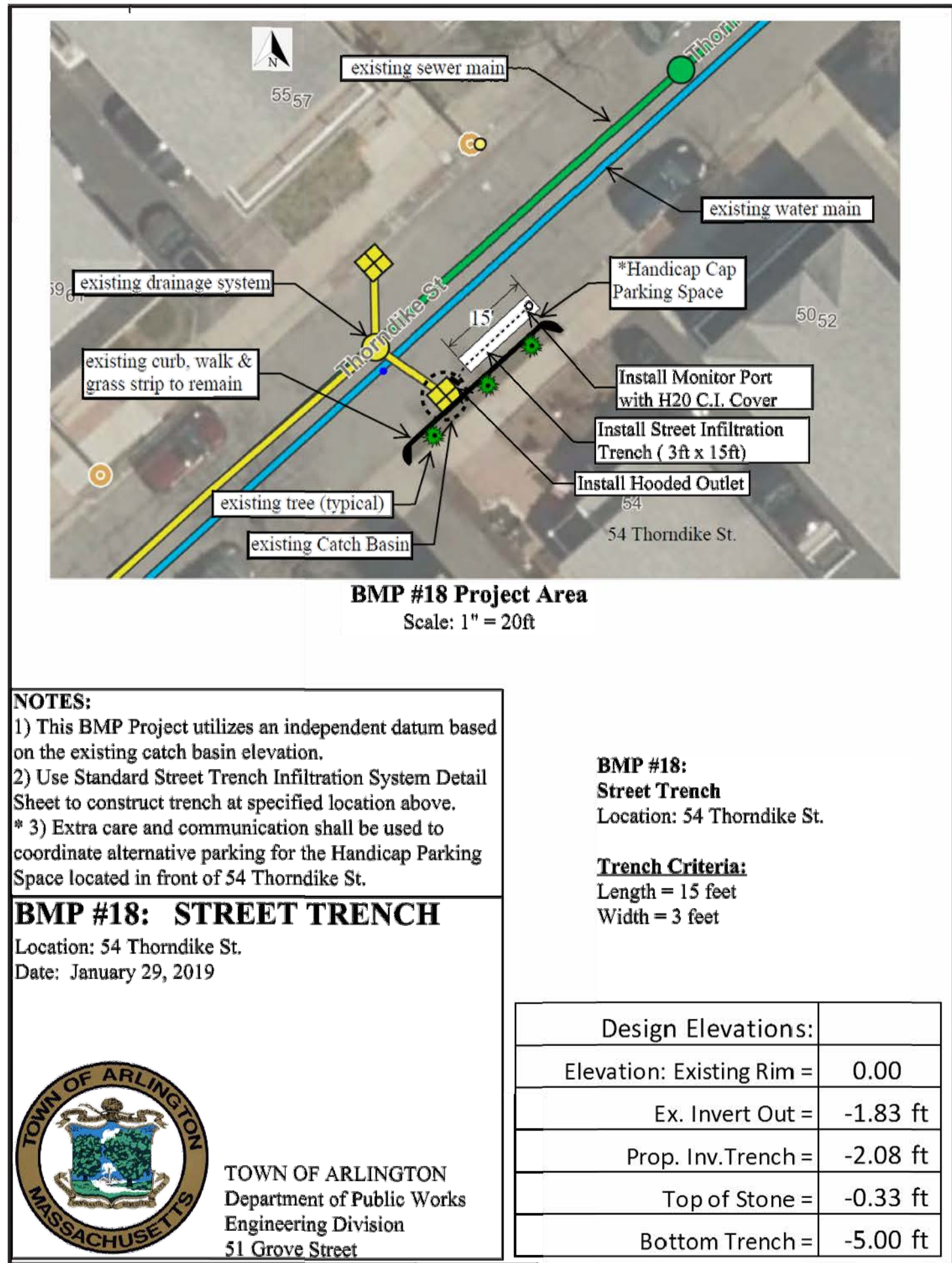
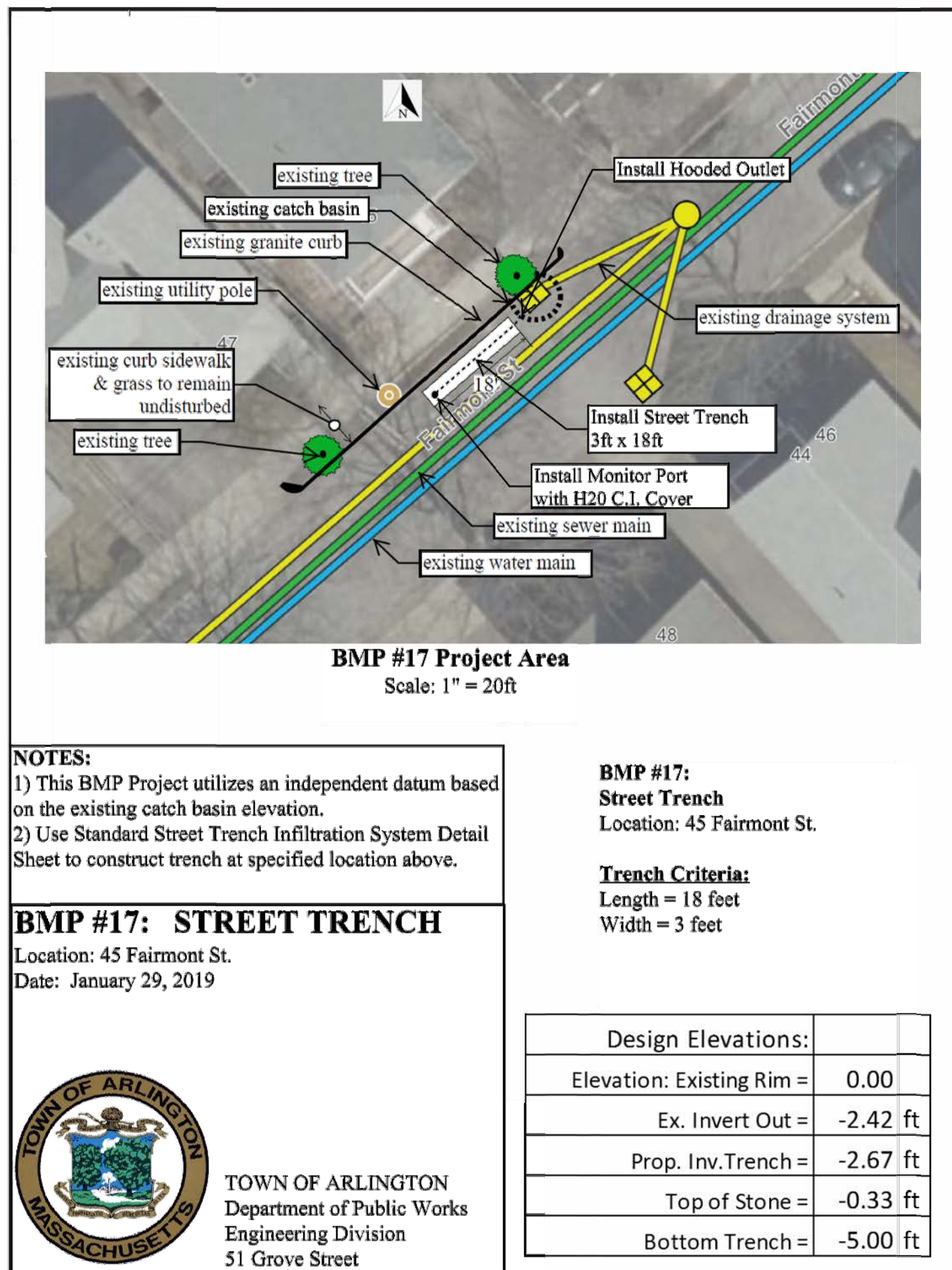
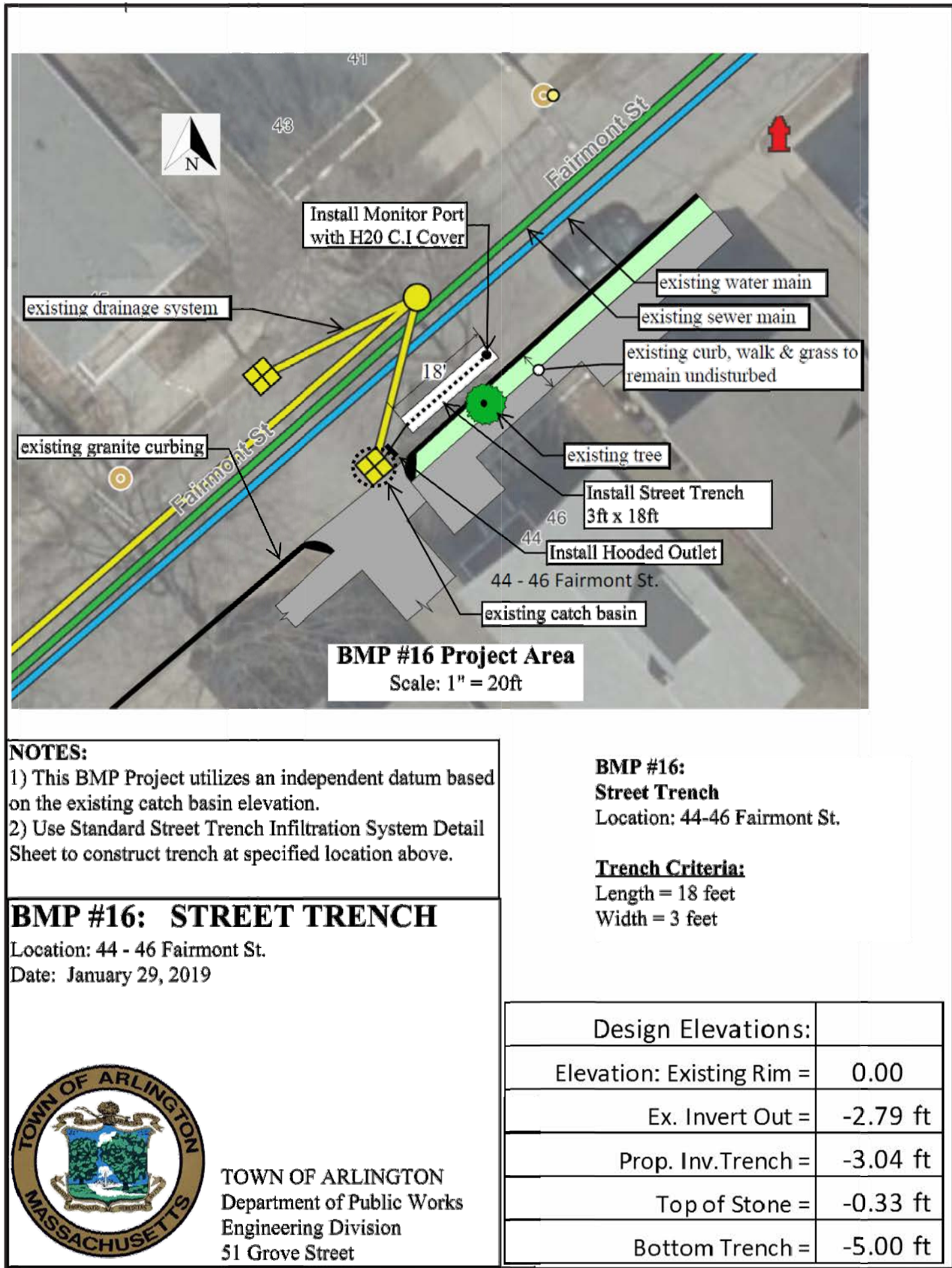
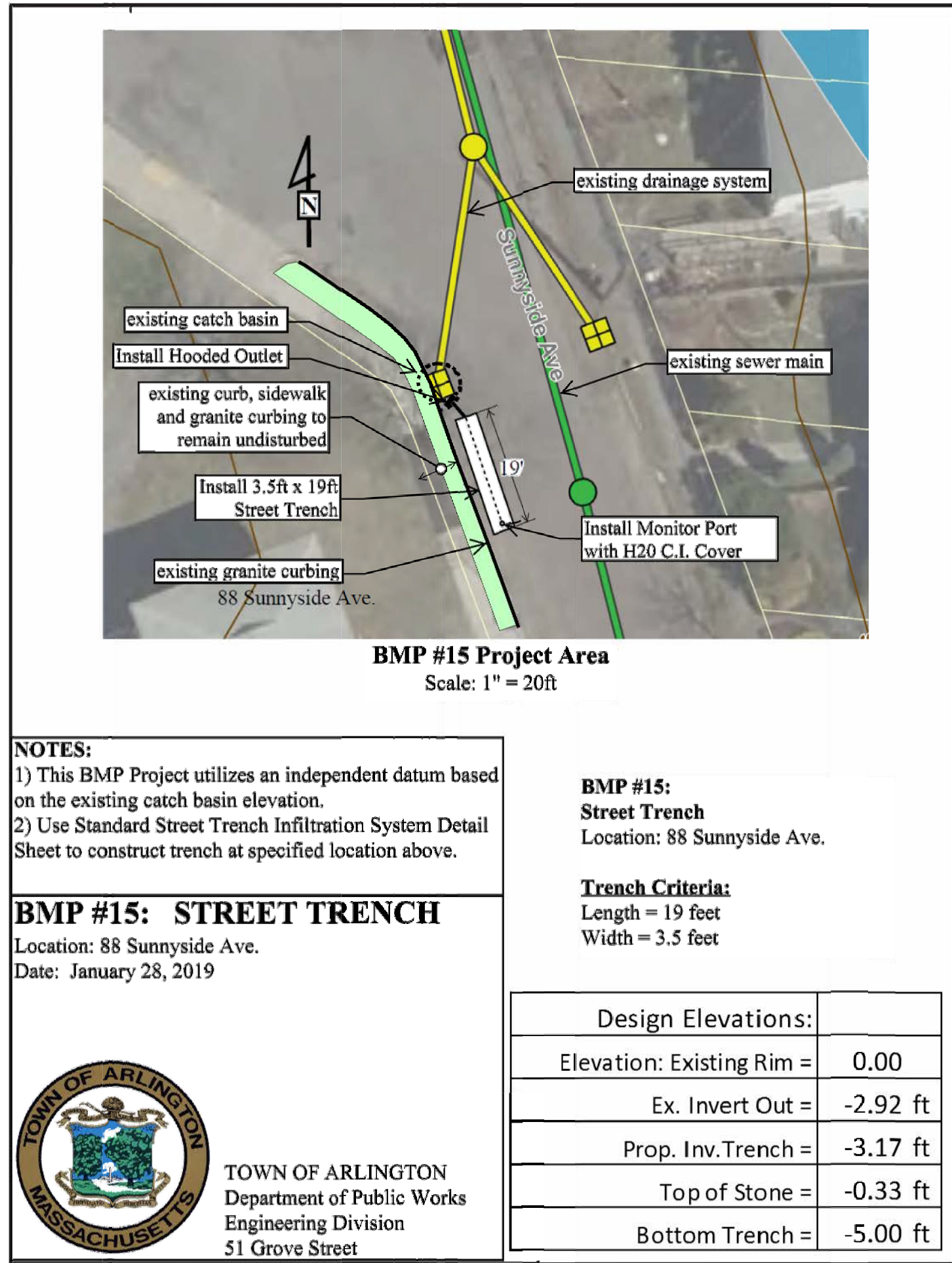
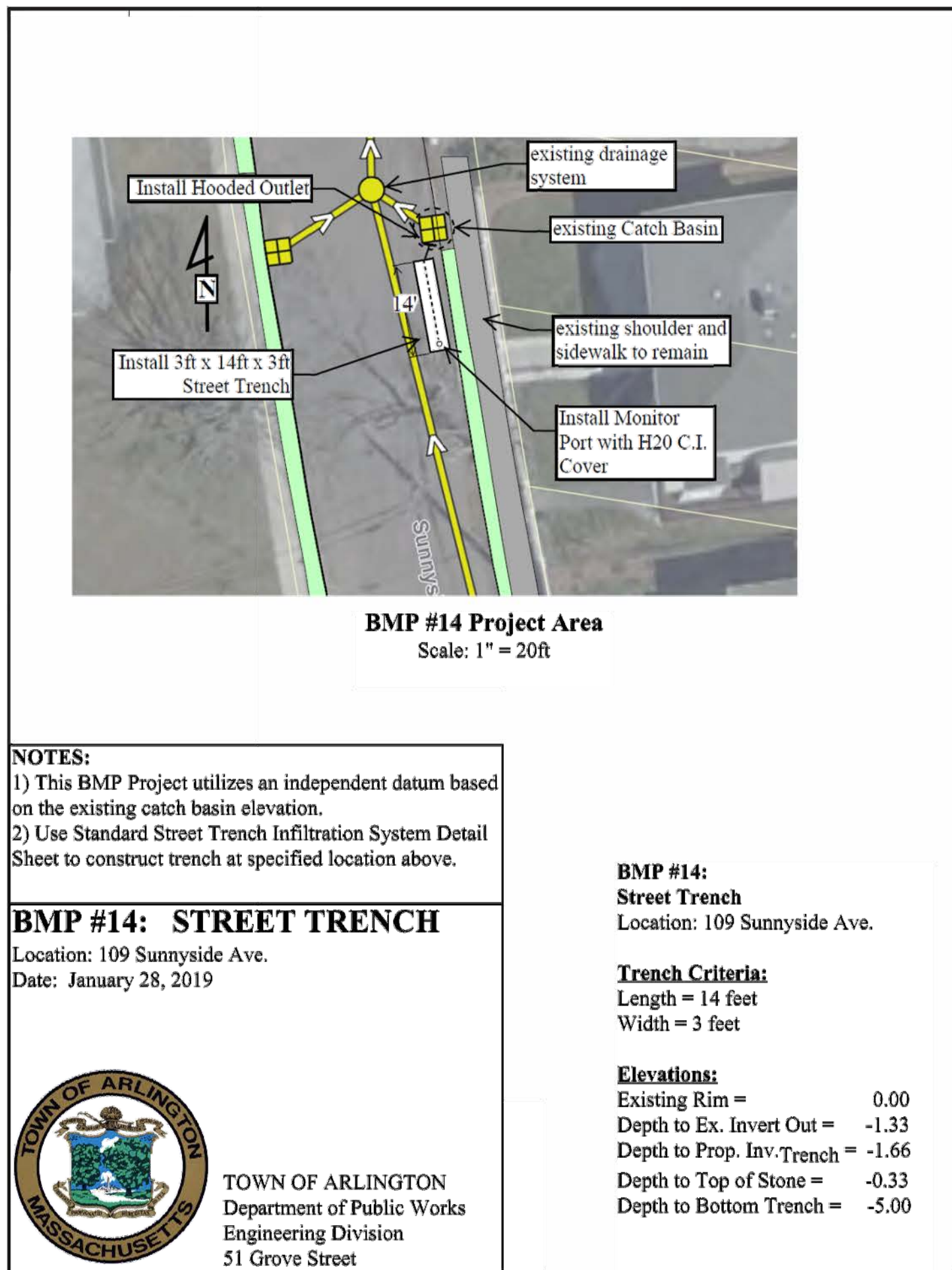
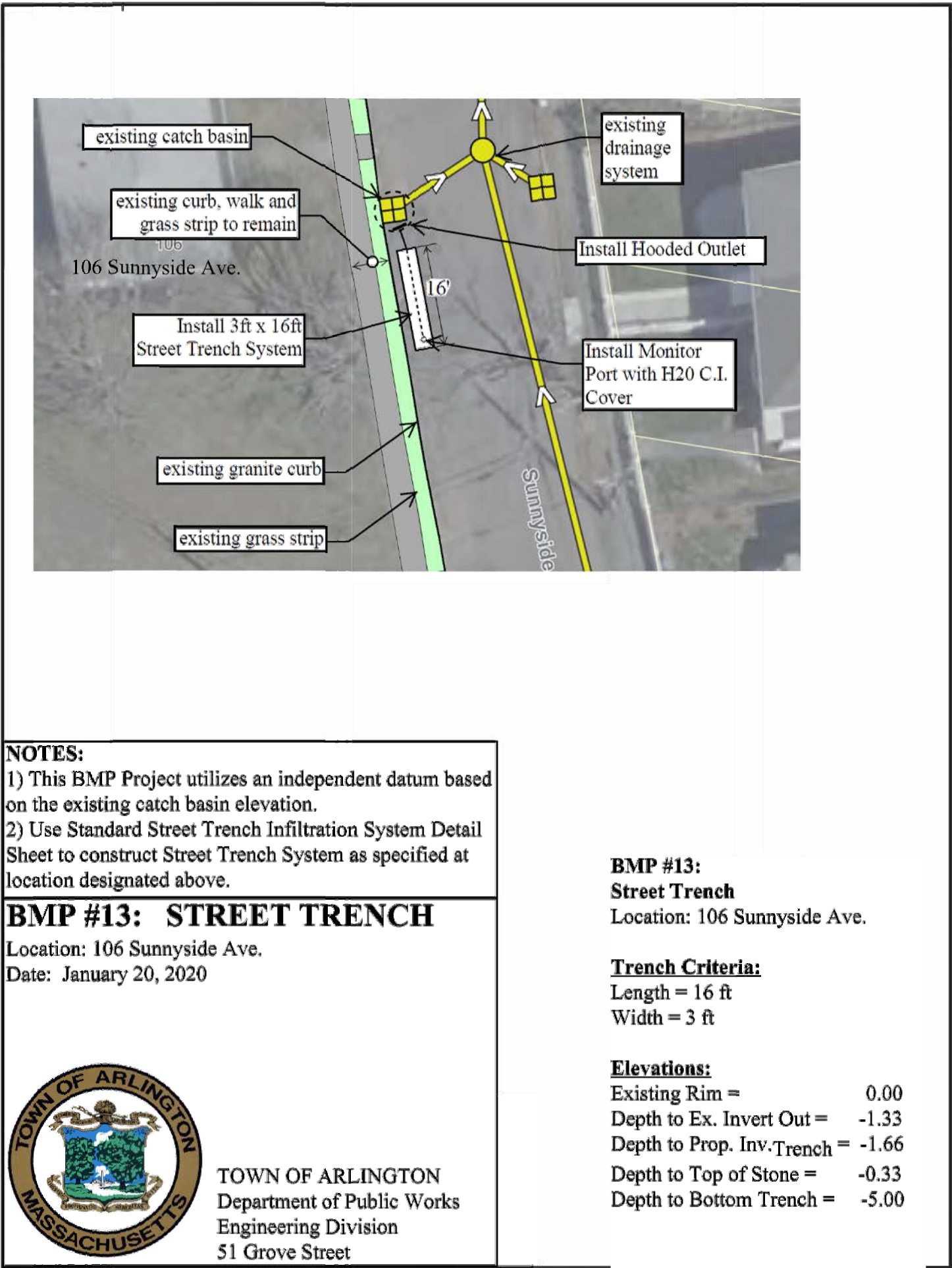
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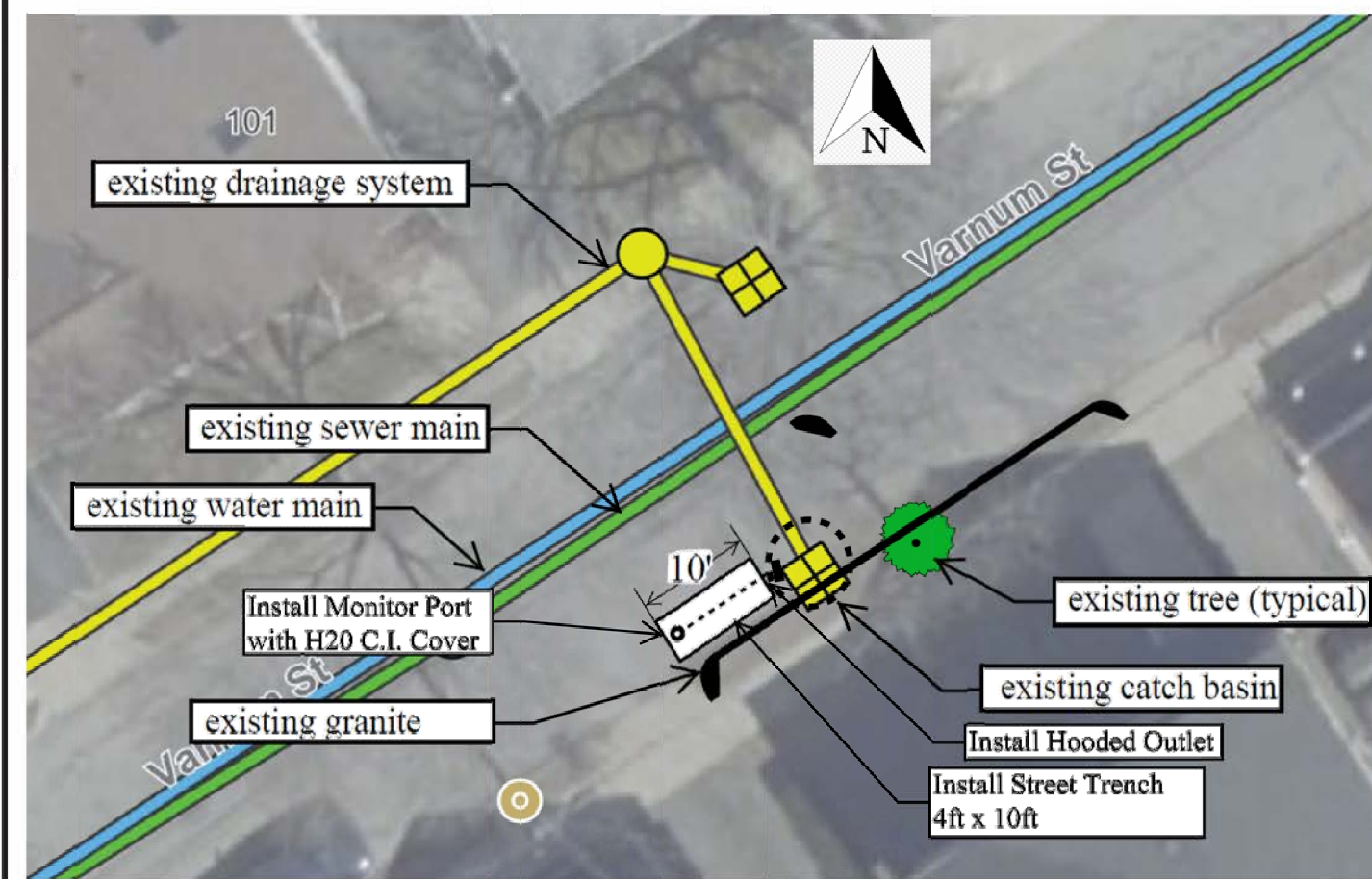
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BMP #7 TO #12		
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BMP #19 Project Area
Scale: 1" = 20ft

NOTES:

- 1) This BMP Project utilizes an independent datum based on the existing catch basin elevation.
2) Use Standard Street Trench Infiltration System Detail Sheet to construct trench at specified location above.

BMP #19: STREET TRENCH

Location: 100 Varnum St.
Date: January 30, 2020

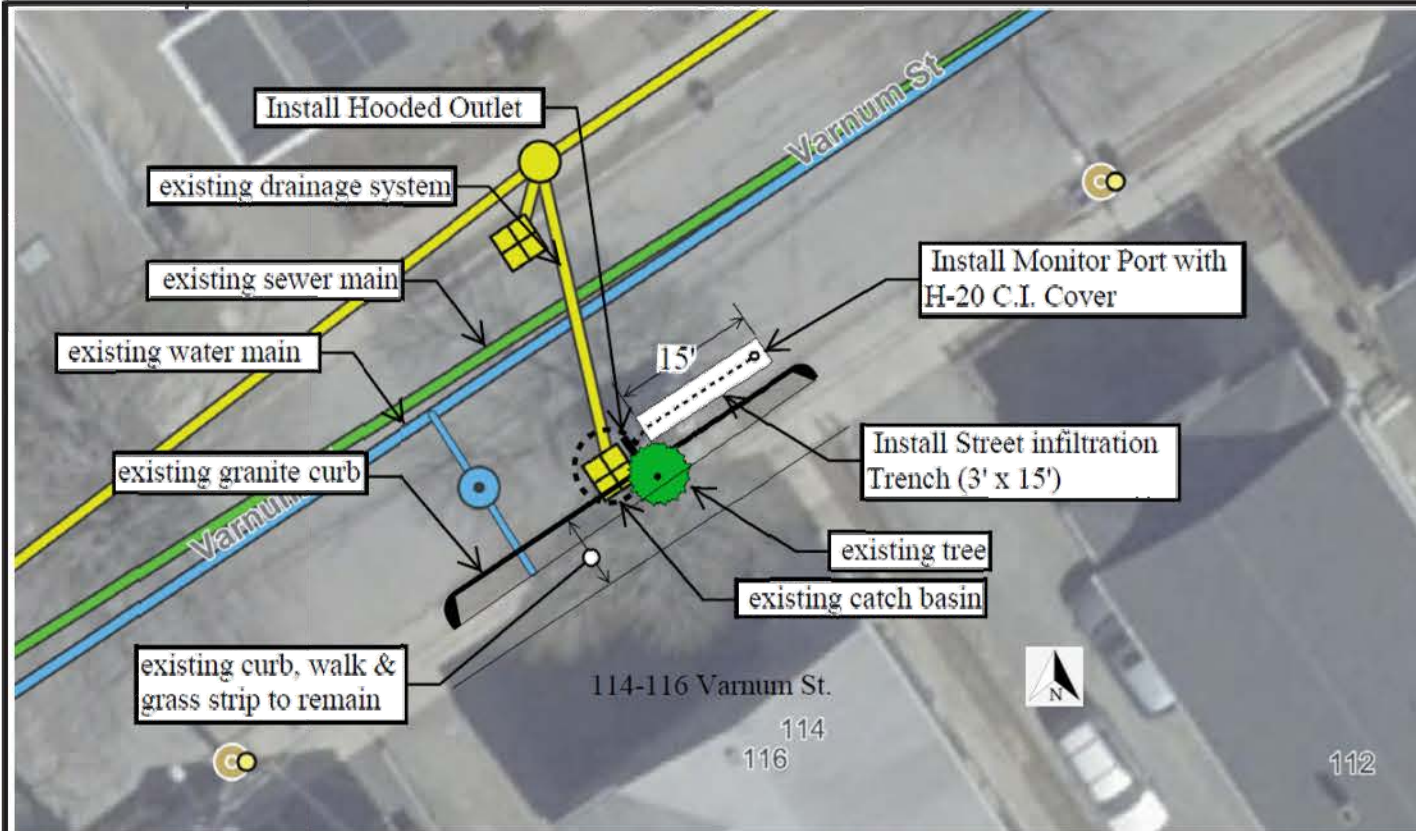


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Department of Public Works
Engineering Division
51 Grove Street

BMP #19:
Street Trench
Location: 100 Varnum St.

Trench Criteria:
Length = 10 feet
Width = 4 feet

Design Elevations:	
Elevation: Existing Rim =	0.00
Ex. Invert Out =	-1.65 ft
Prop. Inv.Trench =	-1.90 ft
Top of Stone =	-0.33 ft
Bottom Trench =	-5.00 ft



BMP #20 Project Area
Scale: 1" = 20ft

NOTES:

- 1) This BMP Project utilizes an independent datum based on the existing catch basin elevation.
2) Use Standard Street Trench Infiltration System Detail Sheet to construct trench at specified location above.

BMP #20: STREET TRENCH

Location: 114 - 116 Varnum St.
Date: January 30, 2020

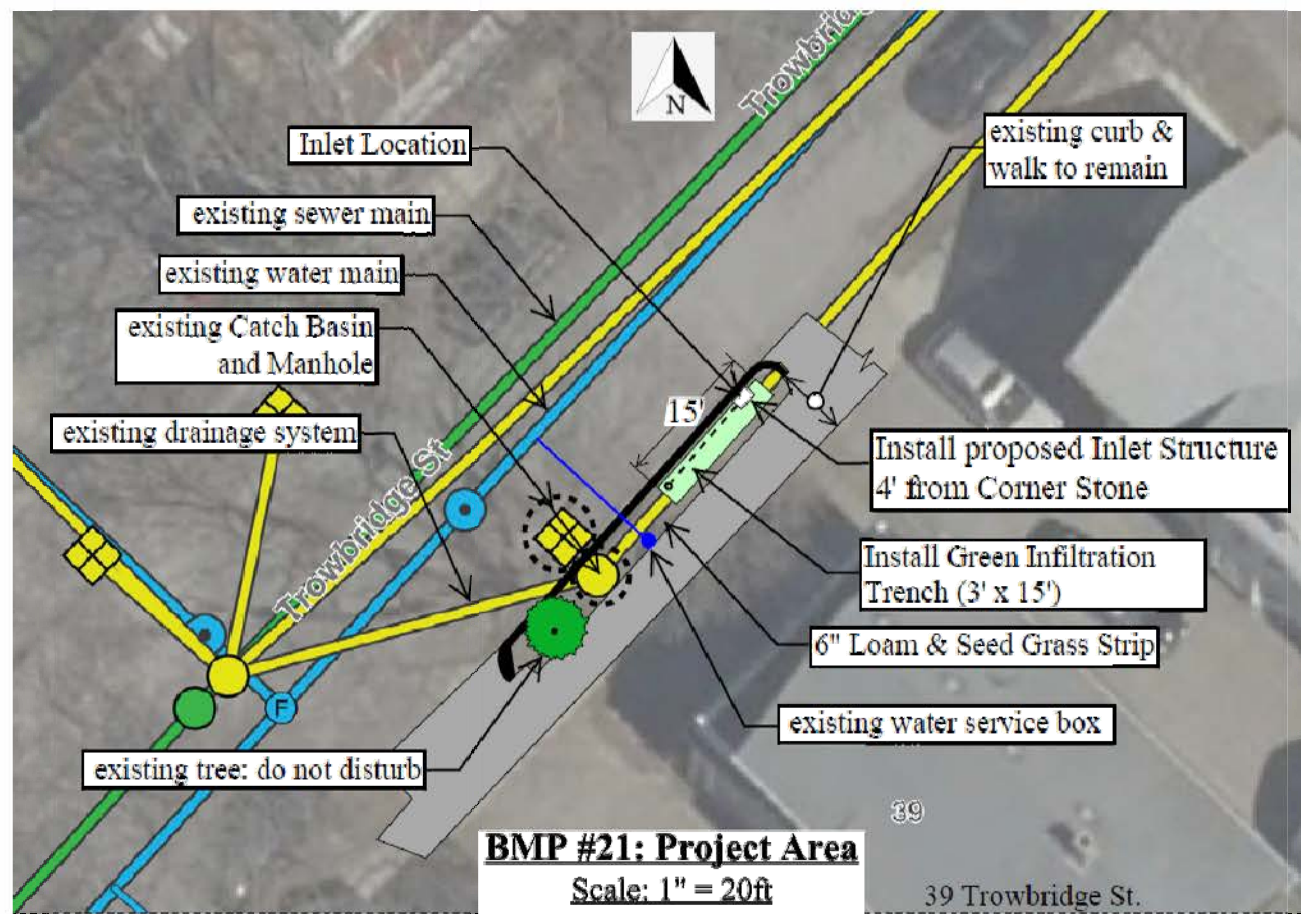


TOWN OF ARLINGTON
Department of Public Works
Engineering Division
51 Grove Street

BMP #20:
Street Trench
Location: 114 - 116 Varnum St.

Trench Criteria:
Length = 15 feet
Width = 3 feet

Design Elevations:	
Elevation: Existing Rim =	0.00
Ex. Invert Out =	-2.00 ft
Prop. Inv.Trench =	-2.25 ft
Top of Stone =	-0.33 ft
Bottom Trench =	-5.00 ft



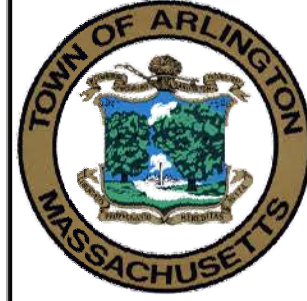
BMP #21: Project Area
Scale: 1" = 20ft

NOTES:

- 1) This BMP Project utilizes an independent datum based on the street gutter elevation at the point of the proposed inlet location.
2) Use Green Trench Detail Sheet to Construct Trench at specified location above.

BMP #21: GREEN TRENCH

Location: 39 Trowbridge St.
Date: January 30, 2020



TOWN OF ARLINGTON
Department of Public Works
Engineering Division
51 Grove Street

BMP #21:
Green Trench
Location: 39 Trowbridge St.

Trench Criteria:
Length = 15 feet
Width = 2 feet

Elevations	
Gutter Inlet:	0.00
Gutter Outlet:	-0.25
Chamber Inlet:	-0.25
4" Invert Out#1:	-0.75
4" Trench Outlet #2:	-0.75
Chamber Bottom:	-1.25
Top of Stone:	-1.25
Top of Stone:	-0.75
4" Invert Perf. pipe:	-1.25
Bottom Stone:	-3.75

NOTES

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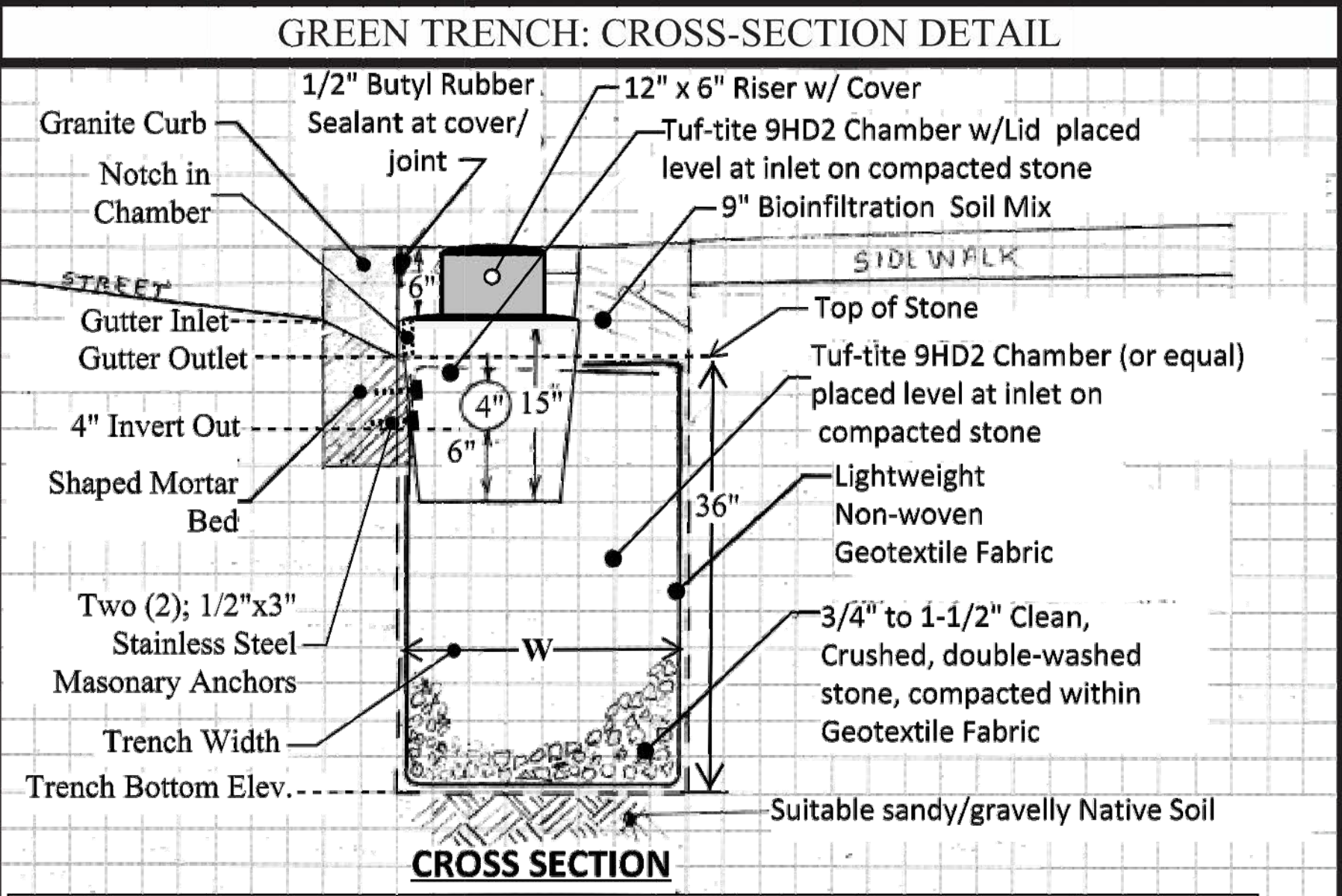
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BMP #19 TO #21

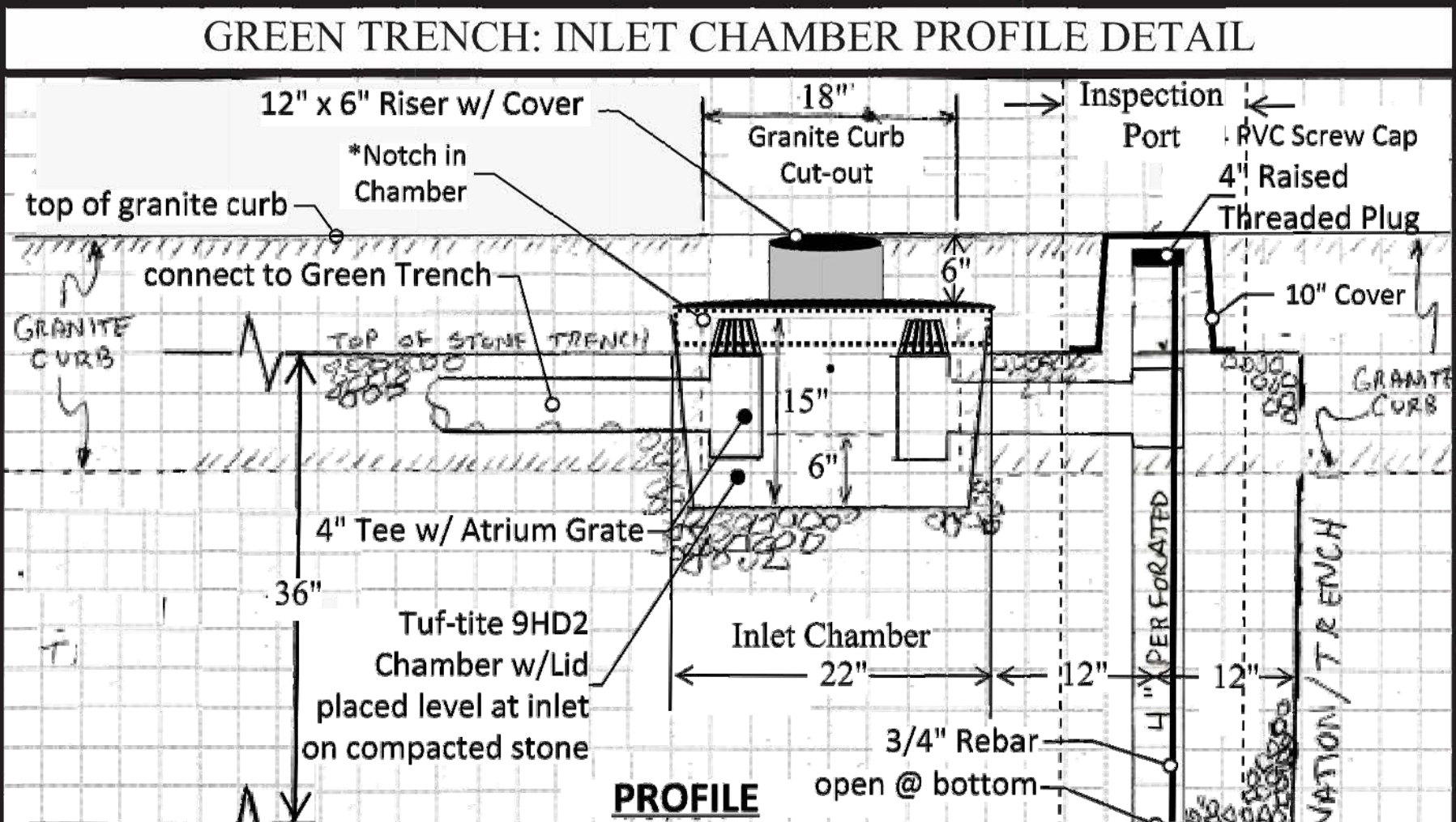
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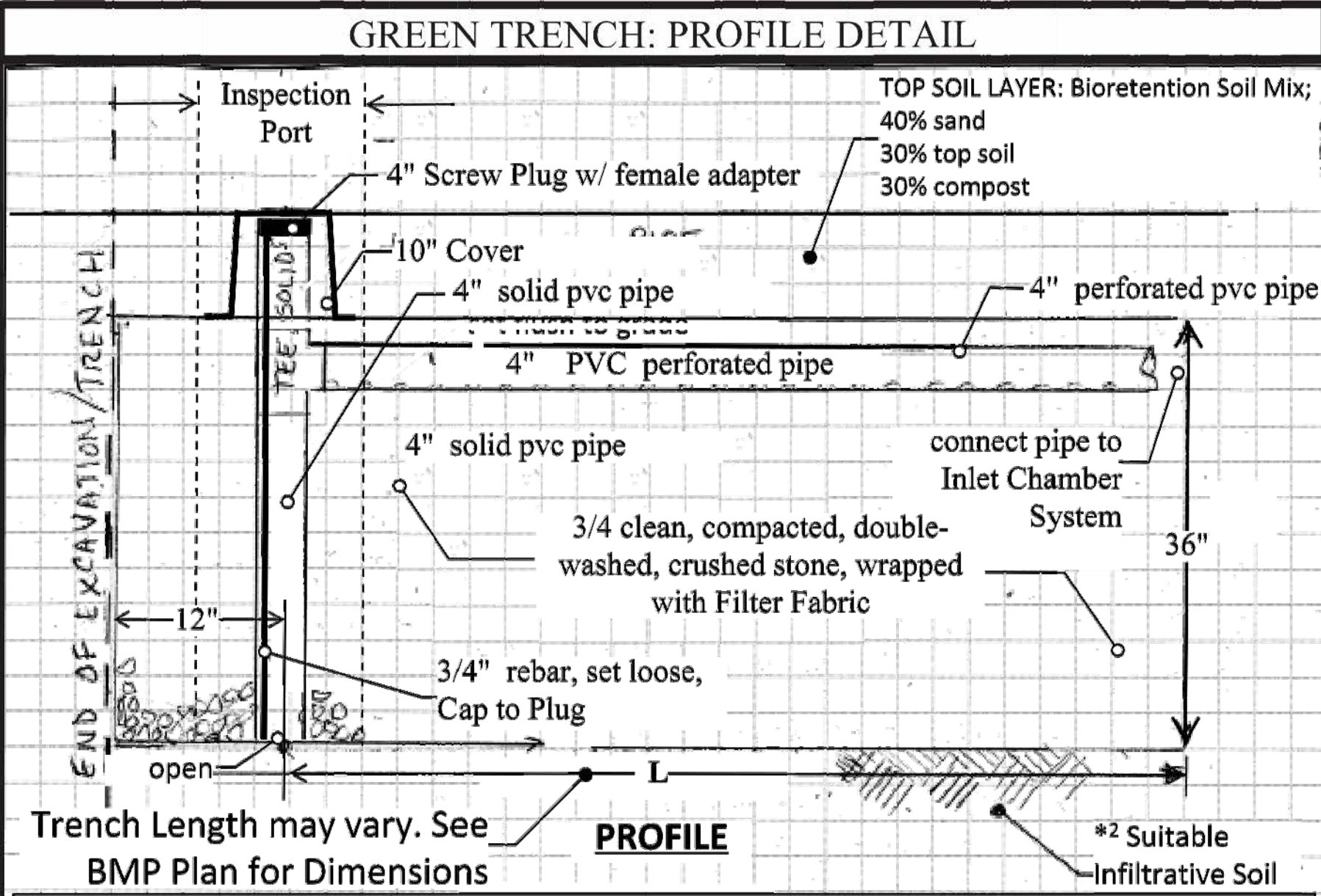
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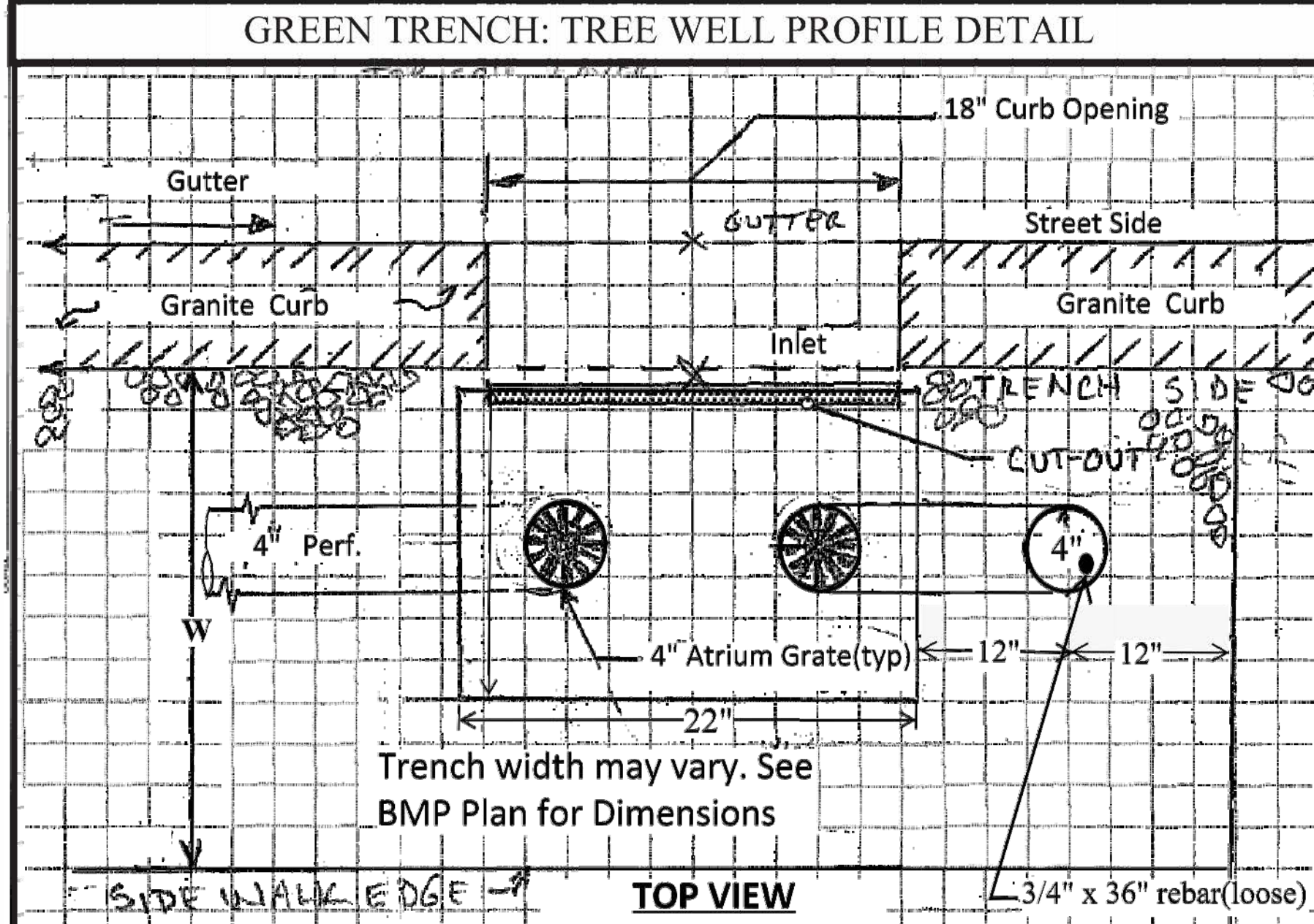
- NOTES:**
- 1) Trench shall be excavated to prescribed depth. Bottom of trench shall be and trench bottom scarified.
 - 2) All deleterious material to be removed and properly disposed of by contractor.
 - 3) All surfaces shall be placed back to original surface condition upon completion of trench.



- INLET CHAMBER SYSTEM NOTES:**
- 1) Tuf-Tite 9HD2 (or equal) shall be used for Inlet Chamber.
 - 2) Inlet Chamber shall be ordered with "No Holes", pipe rings shall only be installed on 2 Outlets.
 - 3) Inlet Chamber shall be placed at prescribed Depth. Remaining indentations shall be fitted with manufacturer's plug.
 - 4) Inlet Chamber shall be set level and include attached to Inlet Mortar Bed with 1/2" x 3" stainless steel masonry anchors, with washer/bolt.
 - 5) Inlet Chamber shall be attached to Inlet Mortar Bed with 1/2" x 3" stainless steel masonry anchors, with washer/bolt.
 - 6) Inlet Chamber System includes chamber, lid, riser, cover, tee (2), atrium grate (2)
 - 7) Inspection Port includes solid pipe(4'), 2-way cleanout, female adapter, threaded plug, 10" cover



- NOTES:**
- 1) Contractor shall coordinate with Engineering Division for inspection of the bottom of excavation prior to installation and collect a soil sample from bottom of excavation and package in zip-lock bag for Engineer.
 - 2) Contractor shall provide sketch indicating length, width and depth of trench and location of chamber, pipe and fittings for verification during Engineering Inspection.



- NOTES:**
- 1) Stone trench to be installed level and compacted with 36" depth. Depth of Top Soil Layer may vary due to slope of street.
 - 2) Top Soil Layer shall slope toward street to prevent ponding.

NOTES

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TRENCH DETAILS

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GREEN TRENCH: INLET DETAIL STREET VIEW PROFILE

6" x 18" x 18" Steel Wheel Guard

EXISTING TOP OF GRANITE CURB

* SEE GUTTER INLET DETAIL

Sloped Inlet Apron

Remove 18" granite section

PROFILE

Granite Curb Section Removed: 6" x 18" x 18"

18"

9"

Steel Wheel Guard

Gutter Inlet

Gutter Outlet

Shaped Mortar Apron w/ 3" Drop

6" x 18" x 18" Steel wheel Guard with Double-sided Welds

ISOMETRIC VIEW

GREEN TRENCH: INLET NOTES:

- 1) Granite Curb shall be sawcut to remove 20" section.
- 2) 18" x 18" x 6" welded steel wheel guard (one-piece) shall be installed with top flush to existing granite curb in opening as detailed.
- 3) Wheel Guard shall be set flush to existing curb and filled with Type-S mortar to lock in frame. Top of Mortar Bed inside Wheel Guard shall be shaped to slope three (3) inches from street gutter to back of wheel guard to form the Inlet Apron (3000 psi) required.
- 4) Wheel Guard edges at granite curb shall be pointed with mortar.
- 5) Inlet Chamber shall be set tight against backside of wheel guard on compacted crushed stone consistent with Green Trench Inlet Details.
- 6) Inlet Chamber shall be marked at inlet apron and an 18" notch shall be cut into chamber riser at Inlet Apron. Cut shall be straight and clean.
- 7) Inlet Chamber shall be set with 6" x 18" notch aligned with Inlet Apron. Inlet Chamber to be held in place by backfilled stone on back-side and void between granite curb and Inlet Chamber filled with Type-S mortar.
- 8) Wheel Guards to be manufactured from 1/2"x6" A36 Steel. Double welded at each joint.

GREEN TRENCH: TREE WELL - PROFILE DETAIL

Top Soil Layer: Bioretention Soil Mix;
40% Sand, 30% Topsoil, 30% Compost

(See Notes)

9"

36"

48"

24"

3/4" x 24" rebar,
driven into Tree Well

(SEE NOTE #1)

FUTURE TREE WELL

GREEN INFILTRATION TRENCH
(See Detail)

4" PERFORATED

Light weight, Non-woven
Geotextile Fabric, Overlap
12" on top

END OF TRENCH EXCAVATION

12"

A - A

NOTES:

- 1) Stone trench to be installed level and compacted with 36" depth. Depth of Top Soil Layer may vary due to slope of street.
- 2) When Tree Well specified, it shall be added to end of specified trench length. See BMP Plan.
- 3) Top Soil Layer shall slope toward street to prevent ponding.

INLET CHAMBER DETAIL and WHEEL GUARD DETAIL

22"

15"

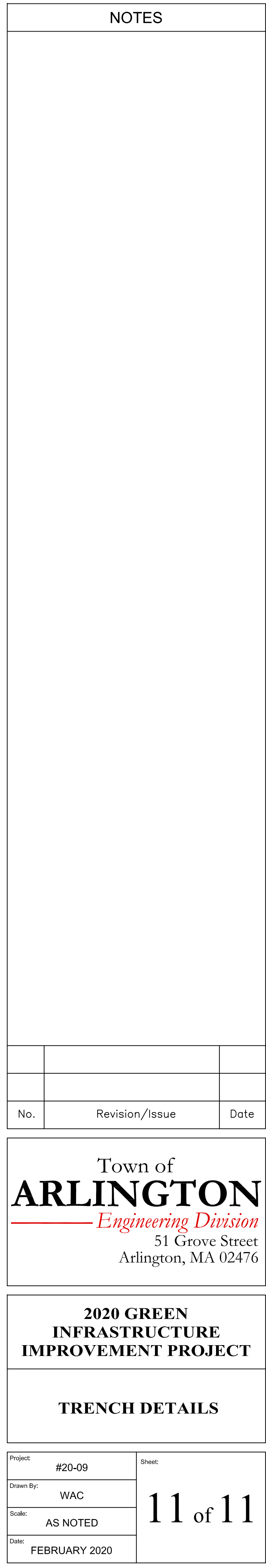
5"

18"

6"

INLET CHAMBER DETAIL

WHEEL GUARD DETAIL



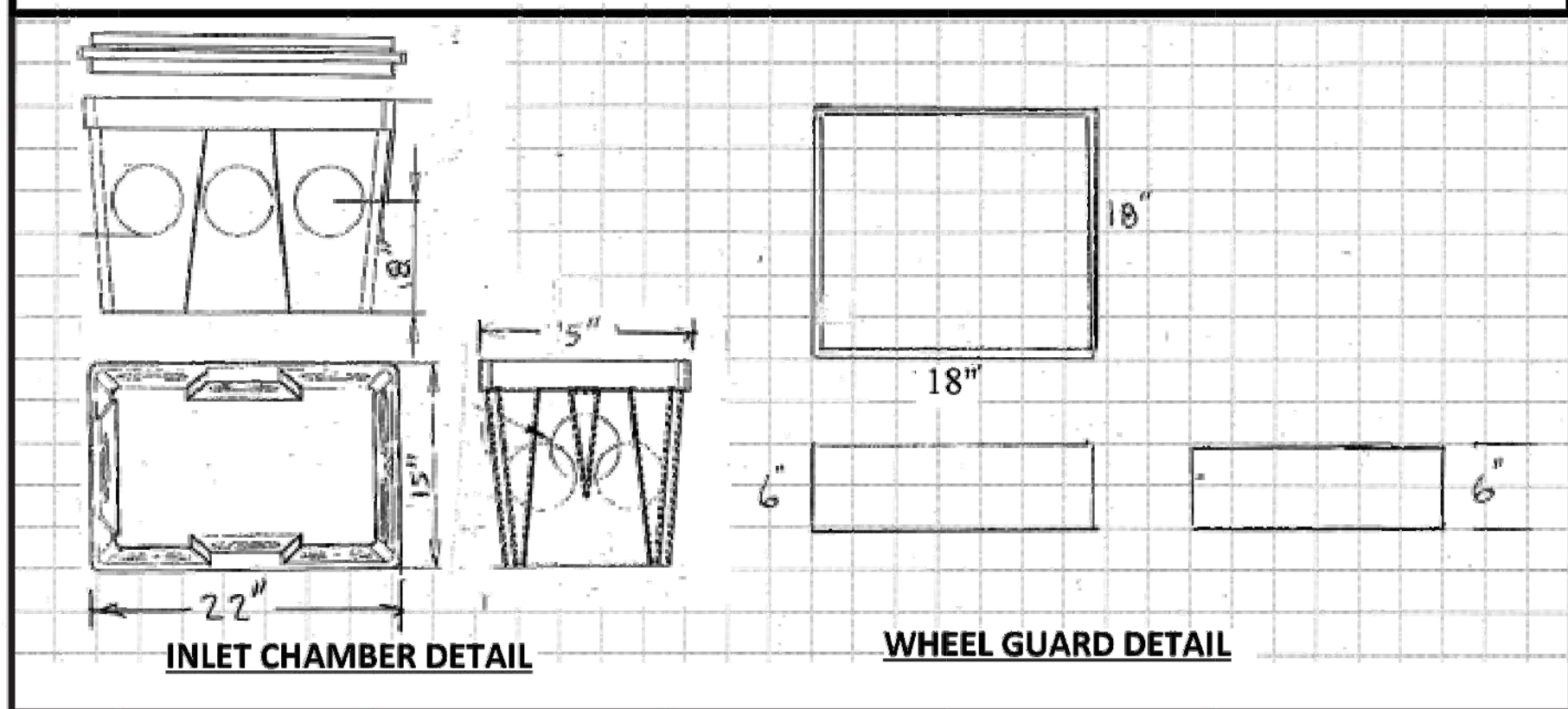
GREEN TRENCH: INLET NOTES:

- 1) Granite Curb shall be sawcut to remove 20" section.
- 2) 18" x 18" x 6" welded steel wheel guard (one-piece) shall be installed with top flush to existing granite curb in opening as detailed.
- 3) Wheel Guard shall be set flush to existing curb and filled with Type-S mortar to lock in frame. Top of Mortar Bed inside Wheel Guard shall be shaped to slope three (3) inches from street gutter to back of wheel guard to form the Inlet Apron (3000 psi) required.
- 4) Wheel Guard edges at granite curb shall be pointed with mortar.
- 5) Inlet Chamber shall be set tight against backside of wheel guard on compacted crushed stone consistent with Green Trench Inlet Details.
- 6) Inlet Chamber shall be marked at inlet apron and an 18" notch shall be cut into chamber riser at Inlet Apron. Cut shall be straight and clean.
- 7) Inlet Chamber shall be set with 6" x 18" notch aligned with Inlet Apron. Inlet Chamber to be held in place by backfilled stone on back-side and void between granite curb and Inlet Chamber filled with Type-S mortar.
- 8) Wheel Guards to be manufactured from 1/2"x6" A36 Steel. Double welded at each joint.

NOTES:

- 1) Stone trench to be installed level and compacted with 36" depth. Depth of Top Soil Layer may vary due to slope of street.
- 2) When Tree Well specified, it shall be added to end of specified trench length. See BMP Plan.
- 3) Top Soil Layer shall slope toward street to prevent ponding.

INLET CHAMBER DETAIL and WHEEL GUARD DETAIL



NOTES:

- 1) BOTTOM OF TRENCH SHALL BE LEVEL AND STONE COMPACTED IN 12" LIFTS UP TO THE BOTTOM OF EXISTING PAVEMENT.
- 2) ALL TRENCHES SHALL BE BACKFILLED AT END OF DAY.
- 3) TRENCHES ARE ALLOWED TO BE CONED/BARRICADED UNTIL FRIDAY OF EACH WEEK TO ALLOW FOR EFFICIENT MATERIAL HANDLING.
- 3) CONTRACTOR SHALL USE MASS STATE MIX AS FOLLOWS:
 - 2-1/2" COURSE OF 3/4" BINDER COMPACTED
 - 1-1/2" COURSE OF 3/8" MASS STATE MIX.

PLAN VIEW

ALLOW 1 FOOT BETWEEN CURB AND EDGE OF TRENCH FOR SUPPORT AND SIDEWALK INTEGRITY

C.I. H2O OBSERVATION AND ACCESS PORT INSTALLED ONE PER STREET

PROP. INFILTRATION TRENCH

EX. DRAIN LINE

EX. RIM

EX. CATCH BASIN (TYPICAL)

ELIMINATOR (OR EQUAL) OIL/DEBRIS TRAP

EX. INV(O)

PROP. INV.(O)

EX. SUMP

EX. SUMP

CROSS SECTION

DEPTH 5" MAX

3"

12" MIN

12" MIN

8" END CAP

24" MIN

3/4" to 1- 1/2" CLEAN, DOUBLE WASHED STONE

MIN 8" NOMINAL INSIDE DIAMETER SCH40 PVC PIPE OR EQUIVALENT

PROFILE VIEW

CONTRACTOR SHALL COORDINATE INSPECTION OF BOTTOM OF EACH TRENCH BY ENGINEERING DIVISION. COLLECT SAMPLE OF SOIL FROM BOTTOM OF EXCAVATION AND PROVIDE A SKETCH OF TRENCH INDICATING TRENCH DIMENSIONS (L, W & D) AND LOCATION OF PIPES, FITTINGS AND COVERS IN RELATION TO CATCH BASINS, SIDEWALKS, POLES AND TREES ETC.

STANDARD STREET TRENCH INFILTRATION SYSTEM
Prepared using UNHSC Detail Sheet from March 2019

DEC 2019
NOT TO SCALE

Town of
ARLINGTON
— *Engineering Division*
51 Grove Street
Arlington, MA 02476

**2020 GREEN
INFRASTRUCTURE
IMPROVEMENT PROJECT**

TRENCH DETAILS

Project:	#20-09	Sheet:	11 of 11
Drawn By:	WAC		
Scale:	AS NOTED		
Date:	FEBRUARY 2020		